PATHOLOGY &LABORATORY MEDICINE MANUAL

FOR HOSPITAL WARDS AND CBOC'S

Prepared By: Sharon Ford Date: 5/6/2009
Sharon Ford
Laboratory Manager

Approved By: Ashit B. Sarker Date: 5/8/2009
Ashit B.Sarker, M.D., PhD
Chief, Pathology & Laboratory Medicine Service

Reviewed By: James C. Steinmetz, M.D. Date: 9/18/2009
James C. Steinmetz, M.D.
Acting Medical Director, Pathology & Laboratory Medicine

Reviewed By: H. Robert Nash, M.D., F.C.A.P. Date: 7/1/2010
H. Robert Nash, M.D., F.C.A.P.
Medical Director, Pathology & Laboratory Medicine

CHANGES TO THIS DIRECTORY

The following is a list of the Changes that have been made to the Laboratory Directory of Services effective 7/1/2010:

Introduction

Name of Medical Director & Service Chief	changed to H. Robert Nash, M.D., F.C.A.P.
Wilkes-Barre VA Outpatient Hours	changed to 7AM – 4:30PM
Stat and ASAP List	Basic Metabolic Profile taken off
Turn-around-time for Routine Tests	Changes to listed TAT's
Laboratory Critical Values	Changes Magnesium and APTT
Profile Definitions	Elimination of Chem 20, Basic Metabolic Panel, Thyroid Profile Coagulation Profile
HIV Testing	Elimination of Procedure for counseling and obtaining consent
Blood Collection Tubes	Lavendar Top Tube changed to K2EDTA; plain red top changed To 6 ml from 7 ml; elimination of green/ grey tubes

CHANGES TO THIS DIRECTORY

The following is a list of the Changes that have been made to the Laboratory Directory of Services effective 7/1/2010:

Chemistry
The following tests had changes made to them

Troponin I	Change in Critical Value
VMA, urine	Change in Reference Range
Testosterone	Change in Reference Range
Anti-ENA	Change in Reference Range &Methodology
Anti-Histone Ab	Change in Reference Range & Methodology
Anti-Scleroderma Ab	Change in Reference Range & Methodology
Anti-Centromere Ab	Change in Reference Range & Methodology
ACTH	Change in Reference Range & Methodology; Change in specimen requirement & processing
Estradiol	Change in Reference Range & Methodology
Folate, RBC	Change in Reference Range & Methodology; Change in specimen requirement & processing
Legionella urinary Ag	Test no longer available
Free Light Chains, Serum	Addition of Test (New)
CCP Antibodies	Addition of Test (New)
Anti-GBM	Change in Reference Range
Ceruloplasmin	Change in Specimen Requirements & Processing
Vitamin K1	Addition of Test (New)
Vitamin D	Change in reference laboratory
Catecholamines, Urinary Fractionated	Change in Reference Range

INTRODUCTION

Meaningful laboratory test results can only be obtained with proper preparation of the patient and/ or collection of specimens. On occasion, laboratory tests have to be repeated because of lack of proper preparation of the patient.

This new edition of our laboratory manual includes instructions that heretofore have been circulated as separate Hospital Memorandums. A copy of these Hospital Memorandums will be provided in one portion of this manual. With the inclusion of pertinent policies into a single manual, the Laboratory Procedure Manual offers an invaluable aid to the clinician, to each nursing unit of the hospital and to each outpatient treatment care area.

The Laboratory would appreciate close compliance with the stated criteria in the Procedure Manual, since a complete quality control system must begin with the collection of the specimen.

Laboratory test ordering and results reporting are done through the VISTA computer package. Test requirements are also available via the computer. These are explained in the Computer section of this manual.

INTRODUCTION

If at any time there are questions concerning proper specimen collection, result reporting or an other Laboratory concern, contact the appropriate department in the Laboratory. The following is a list of Laboratory Staff and their extensions.

TITLE	NAME	EXTENSION
Medical Director & Service Chief, Pathology & Laboratory Medicine	H. Robert Nash, M.D., F.C.A.P.	7532
Laboratory Manager	Sharon Ford	7535
Medical Technology Co-ordinators	Ann Majikes	4014
(Point-of-Care)	Linda Policare	7541
Laboratory Information Manager	Wanda Stuccio	4869
Chemistry Lead Technologist	Marianne Telincho	4154
Hematology Lead Technologist	Catherine Gambo	4119
Microbiology Lead Technologist	Brenda Krammes	7539
Administrative (office) Staff	Barbara Helmbold	7531 7533

INTRODUCTION

If at any time there are questions concerning proper specimen collection, result reporting or an other Laboratory concern, contact the appropriate department in the Laboratory. The following is a list of phone extensions for the appropriate departments:

Laboratory Section	**Extension**
Specimen Handling	7544
Chemistry	7542, 7543
Hematology	7537
Coagulation	4913
Blood Bank	7240
Blood Bank Fax (Direct)	570-819-5199
Microbiology	7538
Microbiology (PCR Testing)	7539
Urinalysis	7536
Histopathology	7540
Morgue	7180
Phlebotomy	4310, 7785

INTRODUCTION

AVAILABILIY OF PHLEBOTOMOY SERVICES

WILKES-BARRE VAMC:

STAT COLLECTIONS:

24 Hours a day: Phlebotomy services are provided by the Laboratory

IN- PATIENT ROUTINE COLLECTION TIMES:

The Laboratory will conduct routine blood sampling rounds during the following times:

Seven days a week including Holidays

6:00 AM

2:00 PM

It is requested that whenever possible, the Routine Laboratory collection times be utilized.

WILKES-BARRE VA OUTPATIENT HOURS

3rd Floor Clinical Addition: 7AM – 4:30 PM Monday - Friday

INTRODUCTION

LABORATORY TESTING

Information regarding all laboratory tests may be found in the individual sections of this Manual as listed: Chemistry, Immunology, Microbiology, Hematology, Blood Bank and Anatomic Pathology. There is also a section for Patient Instructions that may be used when patients are to perform certain tests such as a Glucose Tolerance, a 24 Hr. Urine Test or Hemoccult Slide Testing.

Each individual section of the manual lists names of tests that may be ordered and provides information regarding the Test Methodology, the specimen requirements, special instructions and reference ranges. Additionally, it includes the testing site. Testing may be performed on-site or it may be sent to the Philadelphia VA Laboratory or our Reference Laboratory, which in most cases is ***Laboratory Corporation of America (LabCorp).*** In many cases, information is already provided for you regarding most testing. Further information or for a more comprehensive listing of tests provided by ***LabCorp***, you may go to their on-line directory of services as follows: http://labcorp.com/dos/index.html

This section of the Manual will provide for you General Laboratory Information regarding the following topics:
Laboratory Test Ordering including Verbal Orders
STAT and Routine Laboratory Tests and Turn-around-Times
Critical Value Lists
Laboratory Profiles and Tests included in these profiles
Information on Hepatitis Testing
Information on HIV Testing
Special Instructions for Collecting some Therapeutic Drugs—further information in the Chemistry Section
A Chart for 24-Hour Urine Preservatives
Venipuncture Collection Procedure
Blood Collection Tube Information
Listing of Fasting Lab Tests
Patient and Specimen Identification Requirements
Criteria for Rejection of Unsatisfactory Specimens
Specimen Transport and Delivery within the Hospital & from CBOC's
Specimen Processing Information
Results Reporting Information

INTRODUCTION

LABORATORY TEST ORDERING

1. In order to comply with State and Federal regulatory agencies, the laboratory will only perform tests that are ordered by health care providers who are credentialed and privileged at the Department of Veterans Affairs Medical Center Wilkes-Barre.

2. All test orders must include the patient's full name, full social security number, the name of the provider and the name of the tests requested. The clinician should also state the date and time in which he/she wants the specimen collected.

To Place and Order

The following is a description on how to place an order in the computer through CPRS.

Some quick labs are available from the Add Order Screen. The collection time for these is usually the next routine lab collection, unless otherwise specified. To enter a lab request:

1. Type the name of the lab tests desired
2. Choose the time/ method of collection. Select one of the collection options, or enter a specific date and time, e.g., T+3@500, or Now.

See the Example on the next page

EXAMPLE

Select Item(s):Done// **70** 70
--Laboratory—
Delay release of these orders? No// **<Enter>**
Lab Test: **glucose**
1. GLUCOSE
2. GLUCOSE TOLERANCE (URINE)
3. GLUCOSE TOLERANCE TEST
4. GLUCOSE, OTHER
CHOOSE 1-4: **2** GLUCOSE TOLERANCE (URINE)
SEND TO LAB – Means the patient is ambulatory and will be sent to the
Laboratory draw room to have blood drawn.
WARD COLLECT – Means that either the physician or a nurse will be
Collecting
The sample on the ward.
LAB BLOOD TEAM – Means the phlebotomist from Lab will draw the blood on the
Ward. This method is limited to laboratory defined collection times.
SP Send patient to lab
WC Ward collect & deliver
LC Lab blood team
Collected By: Ward collect & deliver// **<Enter>**
Collection Date/Time: TODAY// **<Enter>**
Urgency: ROUTINE// <**Enter>**
How Often: ONE TIME//

Lab Test: GLUCOSE TOLERANCE (URINE)
Collected By: Ward collect & deliver
Collection Sample: URINE
Specimen: URINE
Collection Date/ Time: TODAY (11/25/2008)
Urgency: ROUTINE
How Often: ONE TIME

Order Checks:
>>>**Duplicate order: GLUCOSE TOLERANCE (URINE) URINE WC [UNRELEASED]**

(P)lace, (E)dit, or (C)ancel this order? PLACE// **c** CANCEL
……order cancelled.

NOTE: The above example demonstrates Order Checking. A notice that this order is a duplicate of a previously placed order for this patient is displayed, with the option to place, edit, or cancel the order.

TIP: To change a lab urgency "on-the-fly": When you select a quick order from the menu, enter the number of the item followed by =*.

INTRODUCTION

VERBAL ORDERS

Often times a phone call is received by the Laboratory to add tests to a specimen that is already in the laboratory. In an effort to save the patient an additional phlebotomy draw and to reduce the amount of blood that is needed to be taken from a patient, it is practice to accept a verbal order if the following steps are taken:

1. It should be the ordering clinician making the phone call. In addition, the ordering clinician must identify himself/ herself for documentation.

2. The ordering clinician must agree to place the request for testing in the computerized patient record. Therefore, a new order number will be generated for the request. The clinician will have someone call the laboratory with the new order number.

3. The ordering clinician must have the patient's entire name and full social security number. In addition, the location of the patient should be known. Results for the tests will not be available in the computer system until the order is received.

4. The technologist should read back to the clinician the patient's full name and full Social Security number and the tests that are being requested. At that time, the technologist will check the computer to see what tests were previously ordered. This is so he/ she can see if we have the correct sample type in the laboratory. The technologist will pull the specimens that will be needed for testing.

5. When the order number is called to the laboratory, the technologist must check to see if the patient name and social security number match those that the ordering clinician requested verbally. If they do not match, the technologist will notify the ordering clinician. If they do match, the technologist may continue by accessioning the order.

6. When the order number is accessioned, the time and date of the original specimen should be put in the computer as the collection time.

Note: At no time will orders be accepted from a clinician that is not in the Wilkes-Barre VA Medical Center System. If they are an approved Wilkes-Barre VA clinician, they will be in the VISTA System.

INTRODUCTION

LABORATORY STAT AND ASAP REQUESTS

The Laboratory will honor STAT and/ or ASAP requests for specified tests.

STAT REQUESTS:

1. Stat requests should be made for critical purposes and are available on a 24 hour basis.

2. Results will be provided within 1 hour for all tests identified as "STAT".

3. STAT requests that are to be draw by the Laboratory should be ordered as Immediate Collect and queued to the Laboratory printer. To alert the laboratory that there is a STAT to be collected, a telephone call should ALWAYS be placed at the same time.

4. STAT requests that are drawn on the ward by the Physician or Nurse should be delivered to the Laboratory Immediately. Upon arrival in the Laboratory, the person delivering the stat should time stamp the stat requisition and bring the specimen into the laboratory. If possible, the person delivering the stat should let someone know that they have brought a stat.

5. Results for all STAT requests will be available in the computer immediately after release by the technologist.

ASAP REQUESTS:

1. ASAP requests will be available on a 24 hour basis.

2. Results for ASAP requests will be provided within 4 hours.

3. ASAP requests that are to be drawn by the Laboratory should be ordered as such and queued to the Laboratory printer. A telephone call to the Laboratory is also necessary.

4. Results for ASAP requests will be available in the computer immediately after release by the technologist.

INTRODUCTION

STAT AND ASAP LIST

The following is a list of tests that will be provide as STAT or ASAP upon request:

CHEMISTRY

Alcohol
Ammonia
Amylase
Comprehensive Profile
CSF Protein*
Digoxin
Dilantin
Lactic Acid
Osmolality #
Phenobarbital
Theophylline
Troponin-I

HEMATOLOGY

CBC or any Portion
Cell Count on Fluids*

COAGULATION

D-Dimer
Fibrinogen
Partial Thromboplastin Time
Prothrombin Time

BLOOD BANK

Type and Crossmatch*
Type and Screen*

MICROBIOLOGY

Blood Cultures
Cerebrospinal Fluid*
Gram Stains
MRSA by PCR (2 hr. TAT)

URINALYSIS

Urine Pregnancy
Urinalysis

AVAILABLE AS ASAP ONLY:
MRSA by PCR

* Denotes that tests are not collected at any CBOC or Outpatient Clinic
# Denotes that these tests are not performed at the Wilkes-Barre Medical Center Laboratory, but will be sent to a nearby facility as STAT or ASAP as indicated on the request
Microbiology: Blood Cultures and Cerebrospinal Fluid will be processed as STAT, but will not be called

INTRODUCTION
ROUTINE LABORATORY REQUESTS

Routine Laboratory requests are any requests that are not needed for critical purposes. They are also requests that are not needed for any specific time frame.

ROUTINE REQESTS:

1. Routine collections will be provided by the laboratory seven days per week including Holidays at the following times:

   6 AM
   2 PM

2. To request routine lab collects, use the following procedure:

   a. Requests for routine lab draws must be identified as such in the computer and can be accomplished by using the Lab order function.

   b. Requests for routine lab draws must be made using the above stated times ONLY.

   c. All requests for routine lab draws must be placed in the computer ½ hour prior to the lab collect times.

3. In all cases, requests for the lab to draw blood must be ordered as "Lab Collect". Requests for "Ward Collect" are not drawn by the Laboratory.

INTRODUCTION
TURN-AROUND TIMES FOR ROUTINE TESTS PERFORMED ON-SITE

The routine turn-around time is defined as the interval between specimen receipt by the processing Laboratory personnel and the results reporting.

4 HOURS	8 HOURS	8 HOURS	24 HOURS	3 DAYS	48 HOURS	5 DAYS
Body Fluid Cell Count	Acetone	Urea Nitrogen	Gram Stains	HgbA1C	Stool Occult Blood	Blood Culture Final Report
Body Fluid Differential	Albumin	Uric Acid	AFB Smear			
PT	Alk Phos	Urine chem's	HIV Screen	Routine Culture & Sensitivity	Routine Surgical Pathology	
APTT	ALT	Fluid chem's	Source Pt. Blood Culture (Prelimary Report)			
FDP	Amylase	CBC				
Fibrinogen	AST	CBC w Diff			Routine Non-GYN Cytology	
D-Dimer	Bilirubin, Direct	Retic Count				
Carbamezepine	Bilirubin, TL	Sedrate				
Digoxin	BNP	ABO TYPE				
Ethanol	Calcium	Type & Screen				
Phenobarbital	Chloride	Type and XM				
Phenytoin	Cholesterol	Platelets				
Theophylline	CK	Fresh Frozen Plasma				
Tobramycin	CO2	Direct Coombs				**30 DAYS**
Vancomycin	Creatinine	Urinalysis				Autopsy Final Report
Valproic Acid	GGTP	Urine Pregnancy				
Lithium	Glucose					
Troponin-I	HDL					
CSF Protein	Lactic Acid					
MRSA by PCR	LDH					
	Lipase					
	Magnesium					
	Potassium					
	Protein, Serum					
	Protein, Urine					
	Sodium					
	Trig					

INTRODUCTION

LABORATORY CRITICAL VALUES

Hospital and Laboratory accreditation standards require that criteria shall be established for the immediate notification of the practitioners responsible for the care of the patient when critical limits of specified test results are exceeded.
Immediate notification of the physician by appropriate Laboratory personnel will be accomplished when the results of the following tests exceed critical limits:

CHEMISTRY

Sodium	120 and below	150 and above MMOL/L
Potassium	3.0 and below	6.0 and above MMOL/L
Glucose	50 and below	400 and above MG/DL
Calcium	6.0 and below	14 and above MMOL/L
Lithium	-	1.4 and above MEQ/L
Amylase	-	250 and above U/L
BUN*	-	60 and above MG/DL
Creatinine*	-	6.0 and above MG/DL
Lactic Acid	-	5.0 and above MG/DL
Ethanol	-	150 and above MG/DL
Theophylline	-	15 and above UG/ML
Dilantin	-	25 and above UG/ML
Phenobarbital	-	60 and above UG/ML
Digoxin	-	>2.0 NG/ML
Magnesium	1.0 and below	4.5 and above MG/DL
CO2	10 and below	40 and above MMOL/L
Phosphorus	1.0 and below	10 and above MG/DL
Troponin I	-	0.04 and above NG/ML
Uric Acid		16 and above MG/DL

* Those tests marked with an asterisk, BUN and Creatinine, are not defined as emergent for any dialysis patient. Therefore, direct communication of these results is not necessary.

INTRODUCTION
LABORATORY CRITICAL VALUES

HEMATOLOGY

WBC	< 2,000 OR >20,000
HGB	< 8.0 G
HCT	< 21% OR >60%
PLT COUNT	< 50,000 OR >800,000
CSF*	> 5 Mononuclear cells and any Polymorphonuclear cells

COAGULATION

APTT	> 53.2 seconds
INR	>5.0

BLOOD BANK

Any patient who is a **POSITIVE ANTIBODY SCREEN**

Any patient with **INCOMPATIBLE UNITS ON A CROSSMATCH**

INTRODUCTION
LABORATORY CRITICAL VALUES

REFERENCE LAB STUDIES

Positive HIV Results

Abnormal Cytogenetic Studies

MICROBIOLOGY

Positive Blood Culture
Clostridium in Wound Culture
Positive CSF Gram's Stain or Culture
Positive TB Smear or Culture
Stool – Culture Positive for any Enteric Pathogen
Positive Systemic fungus Culture
Positive Joint, Bone, Pericardial, Pleural, and Peritoneal Cultures
Eye – Pseudomonas, Staphylococcus aureaus, or Pure Culture of Any Organism
Positive HIV Screen
Positive MRSA

SURGICAL PATHOLOGY AND CYTOPATHOLOGY

All first time diagnosis of Malignant diagnoses in biopsy or cytology specimens

A change in diagnosis that would have a critical impact on patient management
(this would include any unexpected findings in Cytopathology or Surgical Pathology)

All infectious pathogens requiring immediate therapeutic intervention

INTRODUCTION

PROFILE DEFINITIONS

COMPREHENSIVE METABOLIC PANEL: Draw **(1) 5 ml yellow serum separator tube**

Glucose BUN Creatinine Sodium Potassium Chloride CO2 Total Bilirubin Alkaline Phosphatase Total Protein Albumin AST ALT Calcium

RENAL FUNCTION PANEL: Draw **(1) 5 ml yellow serum separator tube**

Glucose BUN Creatinine Sodium Potassium Chloride CO2 Albumin Calcium Phosphorous

CHEM 7 PROFILE: Draw **(1) 5 ml yellow serum separator tube**

Glucose BUN Creatinine Sodium Potassium Chloride CO2

HEPATIC FUNCTION PANEL: Draw **(1) 5 ml yellow serum separator tube**

Albumin Alkaline Phosphatase Total Bilirubin Direct Bilirubin Total Protein ALT AST

INTRODUCTION

PROFILE DEFINITIONS

LIPID PROFILE: Draw **(1) 5 ml yellow serum separator tube**

HDL Cholesterol Triglyceride LDL

CARDIAC PROFILE: Draw **(1) 5 ml light green tube**

CPK CKMB TROPONIN I

INTRODUCTION
VIRAL HEPATITIS TESTING

The following is a list of accepted abbreviations for the components and corresponding antibodies of the Hepatitis B Virus.

Hepatitis B Surface antigen	HbsAG
Antibody to Surface antigen	anti-HBs
Hepatitis B core antigen	HgcAg
Antibody to core antigen IgM specific	anti-HBc IgM
Hepatitis Be antigen	HbeAg
Antibody to e antigen	anti-Hbe

Hepatitis B Surface Antigen: It is first detected 4 to 12 weeks after exposure and, in 85% of patients, the surface antigen persists for less than 3 months. Patients categorized as a chronic carrier if surface antigen persists or more than 6 months.

Antibody to Surface Antigen: Usually appears during convalescence. It can persist for life, but in some patients it may disappear and only antibody to core remains. Patients with anti-HBs are not considered overly infectious, but they are not acceptable as blood donors.

Antibody o Core – IgM Specific: Virus specific IgM class antibody has been detected in most acute viral infections and is a reliable marker for acute disease. In some studies, anti-HBc IgM is the only specific marker for the diagnosis of acute infections with Hepatitis B.

Hepatitis Be Antigen: It is typically detected 3 to 5 days after the appearance of surface antigen. At this time, patient is most infectious. Sera or other body fluids that are positive for e antigen are three to four times more likely to infect than those that are negative. The e antigen is usually detectable for 2 to 6 weeks.

Antibody to e Antigen: typically appears when the e antigen begins to disappear. Appearance of anti-Hbe has clinical importance because it almost always mean tht the acute viremic stage is ending and that the patient is unlikely to become a chronic carrier. Antibody to e can persist for years, but it usually disappears sooner than anti-Hbs or anti-HBc.

SUMMARY: Five tests are now available for monitoring infections with HBV. Tests for HbsAG should be used to diagnose B hepatitis. Tests for anti-HBc confirm the diagnosis, identify silent carriers and detect past exposure to HBV. Tests for anti-HB confirm the resolution of the disease. Tests for HbeAg quantify infectivity. Tests for anti-Hbe indicate probable resolution of the infection.

INTRODUCTION
SPECIAL INSTRUCTIONS FOR COLLECTING THERAPEUTIC DRUG LEVELS

DILANTIN: Specimen collected is a plain red top tube (7ml).
1. Peak levels should be obtained 3 – 9 hours after an oral dose or 2 – 4 hours after an IV loading dose.
2. Trough levels should be obtained immediately prior to the next dose.
3. Indicate date and time drawn.

THEOPHYLLINE: Specimen collected is a plain red top tube (7ml).
1. Blood Theophylline assays should be performed only after the planned dosage rate has been achieved.
2. Peak levels should be obtained 2-5 hours after oral dose
3. Trough levels should be obtained immediately prior to the next dose.
4. Include time and date drawn.

PHENOBARBITAL: Specimen collected is a plain red top tube (7ml).
1. Because of phenobarbital's long elimination half-life, sampling time is unimportant; however, when making comparative measurements, the sampling times should be consistent.
2. Indicate the date and time drawn.

VALPROIC ACID: Specimen collected is a plain red top tube (7ml).
1. Peak levels should be drawn 1 – 3 hours after oral dose.
2. Trough levels should be drawn immediately before the next oral dose.
3. Indicate the date and time drawn.
4. Typically trough levels are collected for clinical use.

VANCOMYCIN: Specimen collected is a plain red top tube (7ml).
1. Peak levels should be drawn 1 hour after a dose given IM and 30 minutes after IV dose.
2. Trough levels should be drawn immediately before the next dose.
3. Indicate the date and time drawn.

CARBAMAZEPINE: Specimen collected is a plain red top tube (7ml).
1. Peak levels should be drawn 2 – 4 hours after an oral dose
2. Trough levels should be drawn immediately before the next dose.
3. Indicate the date and time drawn.

TOBRAMYCIN: Specimen collected is a plain red top tube (7ml).
1. Peak levels should be drawn 1 hour after a dose given IM and 30 minutes after IV dose.
2. Trough levels should be drawn immediately before the next dose.
3. Indicate the date and time drawn

DIGOXIN: Specimen collected is a plain red top tube (7ml).
1. Specimens should be collected no sooner than 5 – 6 hours after the dose is administered. However, serum levels can be drawn up to immediately before the next dose.
2. Indicate the date and time drawn.

INTRODUCTION
COLLECTION OF 24 HOUR URINE

The following chart indicates the proper specimen preservative of the most common 24 hour urine collections. Procedures which share common preservative can be collected in the same 24 hour urine jug and will be analyzed together.

TEST	REFRIG.	ROOM TEMP	6N HCL 30 ML	1 – 2 G BORIC ACID	NO PRESERV.
Aldosterone	**X**			**X**	
Calcium	**X**		**X**		
Catecholamines			**X**		
Chloride	**X**				**X**
Citrate			**X**		
Copper		**X**			**X**
Cortisol, Free	**X**		♦	**X**	
Creatinine	**X**				**X**
Cystine	**Freeze to send**		**X**		
Glucose	**X**				**X**
5-HIAA	**X**		♦	♦	**X**
Immunoelectrophoresis	**X**				**X**
17-Ketosteroids	**X**		♦	**X**	
Lead		**X**			
Metals, Heavy		**X**			
Metanephrines, Fractionated	**X**		**X**		
Methylmalonic Acid	**X**				**X**
Microalbumin	**X**				**X**
Oxalate			**X**		
Phlosphorus	**X**		**X**		
Potassium	**X**				**X**
Protein Electrophoresis	**X**				**X**
Protein, Total	**X**				**X**
Sodium	**X**				**X**
Uric Acid	**X**				**X**
Urea Nitrogen	**X**				**X**
Vanilmandelic Acid (VMA)			**X**		
Zinc		**X**			

♦ Indicates that this preservative can be used as an alternative to the one indicated

INTRODUCTION
VENIPUNCTURE COLLECTION OF BLOOD

Procedure:

1. Assemble necessary equipment as follows: blood collection needles, safety shield needle holders, blood collection vacuum tubes, tourniquets, alcohol wipes, gauze, sharps disposal container, disinfectant, adhesive labels, waterless soap and powder free gloves.

2. Wash hands and put on gloves

3. Ask patient to identify himself/ herself by name. Ask patient his/ her full Social Security Number. Confirm the name and Social Security number for the patient with the order labels for the patient.

4. Check patient preparation. Certain specimens may require fasting or other patient preparation. If special preparations were necessary, verify and note that the patient followed the instructions.

5. Select the appropriate tubes and needle for the specimens to be collected. Any tubes containing additives should be tapped to dislodge additives from the walls of the tube and the stopper.

6. Establish **specimen collection order**. The following order should be used:

    a. **BLOOD CULTURES**

    b. Citrate tubes (**light blue----Coag)**

    c. Serum tube with or without clot activator, with or without gel (**yellow top SST or red top----Chemistry)**

    d. Heparin tubes with or without gel plasma separator (**green**)

    e. EDTA tubes (**lavender--Hematology**)

    f. Oxalate/ fluoride tubes (**gray**)

NOTE: When using a blood collection set (butterfly) for venipuncture and a coagulation tube is the first tube to be drawn, a discard tube (with at least 3cc of blood) must be drawn first. The discard tube must be a coagulation (blue) tube.

7. Position the patient. Ask the patient which arm is best for drawing blood. The patient should be comfortably positioned with the sleeve rolled up and the arm extended and supported by the blood-drawing chair.

8. Apply the tourniquet 3 to 4 inches above the puncture site. It should be restrictive enough to be slightly uncomfortable for the patient.

9. Ask the patient to make a loose fist. Any vigorous hand exercise like "pumping" must be avoided because if can affect test results.

10. Select a good venipuncture site. Avoid scarred or bruised areas. The median cephalic vein should be used if possible. If a good vein cannot be located, the following techniques may help.

    a. Tapping the inner elbow skin with the index and second finger may cause the vein to dilate.
    b. Massaging the arm from wrist to elbow to force blood into the vein and cause it to distend.
    c. Applying a warm wet towel to the arm for 5 minutes may cause the vein to dilate.
    d. Have the patient dangle the arm for 5 minutes to distend the veins.

    Note: In any of these suggestions, it is important that the tourniquet is not left on for more than one minute as some test results may be affected.

11. Clean the puncture site. Use the alcohol wipe and make a smooth circular pass of the puncture site. Moving in an outward spiral from the zone of penetration. Allow the skin to dry before proceeding. Do not touch the puncture site after cleaning.

12. Break the seal on the needle. Do not remove the needle cap. Screw the needle into the plastic Safety Shield vacutainer holder. Do not pierce the tube as this will result in a loss of vacuum pressure.

13. Perform the venipuncture:

    a. Holding the needle/ tube assembly in your dominant hand, remove the needle cap. Position the needle with the bevel up. (your right hand is dominant if you are right handed) Be careful that the safety device is not in the way.

    b. Grasp the patient's arm just below the puncture site with your non-dominant arm and pull the skin tight with your thumb.

c. Align the needle/ tube assembly with a 15-degree angle to the skin. Use a quick, but small, thrust to penetrate the skin and enter the vein in one motion.

d. Holding the plastic-tube holder's flange with the tube below the puncture site, push the tube onto the needle and puncture the stopper. Keep the tube at an upright angle to prevent tube additives from entering the patient. Blood should flow when the needle punctures the stopper. If it does not, then the needle is either too far in the vein or not in the vein. Backing the needle up a bit will work if the needle is too far in the vein. If it is not in the vein, shifting it should work. If you feel that the needle is in the vein and the blood still does not flow, use another tube.

e. After blood starts to flow, release the tourniquet and ask the patient to open his/ her hand.

f. Constant forward pressure on the tube is necessary to keep the shut-off valve from closing.

g. Remove the tube when blood flow stops. The shut-off valve will close to prevent leakage. If multiple tubes are needed, they should be inserted in the proper order as described above.

14. Remove the needle. A 2x2 inch gauze should be held just above the puncture site. Remove the needle quickly to minimize pain and immediately apply the gauze. Ask the patient to apply pressure to the gauze for at least 2 minutes. When the bleeding stops, apply a fresh bandage, or gauze and tape. The patient should be instructed not to remove it for at least 15 minutes.

15. Dispose of the needle and safety-shield vacutainer holder in a biohazard sharps container.

16. Initial all labels from the patient. While initialing, verify again that all order labels belong to that patient.

17. Place the order labels on all tubes appropriately.

18. Make sure the patient is all right. Confirm bleeding has stopped and patient feels normal.

INTRODUCTION

VENIPUNCTION COLLECTION IMPORTANT POINTS

1. When doing a venipuncture, after cleansing the skin with alcohol, the skin should be allowed to dry in the air. No alcohol should remain on the skin because traces may cause hemolysis and invalidate test results.

2. When specimens are being drawn for **Ethanol** levels, alcohol should not be used to cleanse the skin; a nonalcohol-based cleanser should be used to cleanse the skin.

3. Blood drawn from **Arterial Lines** or any other type of medical line should noted on the specimen label and this notation will be entered into the computer report comments. Laboratory personnel will not draw from Arterial Lines.

4. Patients with **IV's running:** An arm containing an intervenous line should be avoided if at all possible. If it is absolutely necessary to draw from an arm with an IV, the IV should be shut off for 3 – 5 minutes before obtaining the specimen and the blood should be drawn below the IV site. Proceed by drawing the first tube as a discard tube. All tubes after this should be labeled indicating they have been drawn from an IV arm. This notation will be entered into the computer report comments.

5. **Indwelling Lines or Catheters:** Laboratory personnel will not draw from Indwelling lines or catheters. If at all possible, collection of blood should not come from these lines. If the blood must be drawn from an indwelling line, possible heparin contamination and specimen dilution should be considered. When obtaining specimens from indwelling lines that may contain heparin, the line should be flushed with 5 ml of saline, and the first 5 ml of blood or 6-times the line volume (dead space volume of the catheter) be drawn off and discarded before the coagulation tube is filled.

6. **Coagulation Tubes drawn with a Blood Collection Set (Butterfly Needle):**
   It is necessary to draw a discard tube prior to drawing the coagulation tube when using a blood collection set (also known as a butterfly). A blue top tube (coag tube) with at least 3 cc of blood must be drawn first and discarded due to the dead space of the tubing when using the blood collection set.

INTRODUCTION
BLOOD COLLECTION TUBES

The following is a list of tubes most frequently used in the collection of blood along with a brief description of each:

Yellow Top Serum Separator Tube:

-Vacutainer Brand tube with sterile interior
-SST Gel and Clot Activator
-5 ml size
-Used for the collection of Serum
-The serum separator gel forms a barrier between the serum and the clotted red blood cells to keep them from contaminating the serum
-Invert the tube gently no more than 5 times (further inversion may cause altered sample integrity)
-Allow blood to clot for at least 20 min. but not longer than 1 hour
-Centrifuge a minimum of 10 minutes
-Used for the collection of **most Chemistry Studies**

Plain Red Top Tube (6ml size):

-Vacutainer Brand tube with sterile interior
-Contains no additive (no anticoagulants or preservative)
-Used for the collection of serum
-Invert the tube gently after collecting about 5 times
-Used for the collection of **All therapeutic drugs and DAT's (drugs of abuse)**

Plain Red Top Tube (10ml size):

-Vacutainer Brand tube with sterile interior
-Contains no additive (no anticoagulant or preservative)
-Invert gently 5 times after collection
-Used for the collection of **Blood Bank specimens**

INTRODUCTION
BLOOD COLLECTION TUBES

Lavender Top Tube:

-Vacutainer Brand tube with sterile interior
-Contains (K2) EDTA
-4 ml size
-Used for the collection of plasma and whole blood
-Invert gently 5 times after collection to prevent the blood from clotting
- Used for the collection of **CBC's, Ammonia levels** and **Glycosolated Hemoglobin**

Light Blue Top Tube:

-Vacutainer Brand Tube with sterile interior
-Contains 0.5 ml of 0.129 buffered citrate solution as an anticoagulant
-Vacutainer tube **MUST** be adequately filled with 4.5 ml of patient's blood to ensure proper ratio between blood and anticoagulant sodium citrate
-Used for the collection of plasma
-Invert gently 5 times after collection to prevent the blood from clotting
-Used for the collection of **Coagulation Studies**

Gray Top Tube:

-Vacutainer Brand tube with sterile interior
-Contains Potassium Oxalate and Sodium Fluoride
-6 ml size
-Used for the collection of plasma
-Tube must be inverted gently after collecting about 5 times to prevent the blood from clotting
-The potassium oxalate and sodium fluoride additives inhibit glycolysis
-Used for the collection of **Plasma Glucose testing** and **Lactic Acids**

INTRODUCTION

BLOOD COLLECTION TUBES

Green Top Tube:

-Vacutainer Brand tube with Sterile interior
-Contains Sodium Heparin
-10 ml size
-Invert gently 5 times after collection
-Used for the collection of whole blood or fluids
-Used for the collection of **fluids for cell count.** Do not use for CSF.

Mint Green Top Tube:

-Vacutainer Brand (BD) tube with sterile interior
-Contains Gel and Lithium Heparin
-4.5 ml size
-Tube must be inverted gently after collecting about 5 times to prevent the blood from clotting
-Centrifuge about 10 minutes; the gel will form a barrier between the red blood cells and the plasma
-Used for the collection of **Ammonia levels and Troponins.** Note: Ammonia Levels must be collected on ice.

White Top Tube:

-Vacuette tube (Greiner) with sterile interior
-Contains Gel and K2E EDTA K2
-5.0 ml size
-Tube must be inverted gently after collecting about 5 times to prevent the blood from clotting
-Centrifuge about 10 minutes; the gel will form a barrier between the red blood cells and the plasma
-Used for the collection of **HIV Viral Loads and Intact PTH**

Black Top Tube:

-Streck ESR-Vacuum Tube
-Contains 3.2% Sodium Citrate
-1.2 ml size
-Tube must be inverted gently, but thoroughly by inverting 8-10 times due to their smaller tube diameter and draw volumes
-Used for the collection of Sedrates (ESR) only

INTRODUCTION

FASTING LABORATORY TESTS

The following is a list of the most commonly ordered fasting procedures:

12 – 14 Hour Fast
Lipid Profile
Lipoprotein Electrophoresis
Triglyceride

8 Hour Fast
Carotene
Catecholamine
Chem 7 Profile
Cholesterol
Comprehensive Metabolic Profile
Creatinine Clearance
Folate
Glucose
Glucose Tolerance Test
Parathyroid Hormone
Renal Function Panel
TSH
Vitamin B12

INTRODUCTION

PATIENT IDENTIFICATION

Proper patient identification is the first step in the Laboratory in assuring accurate and reliable test results. Therefore, before collecting a specimen, the technologist, phlebotomist, physician or nurse should follow this procedure:

Inpatients

1. Before collecting any specimens, a laboratory request must be in the computer.

2. It is necessary to identify all patients with (2) unique identifiers. The two unique identifiers are the patient's full name and full social security number.

3. With a copy of the orders containing the patient's name and Social Security number in hand, the collector will ask the patient his/ her full name. The collector will check the patient's wristband and compare both the name and Social Security number with what is on the orders. For patients unable to respond, checking of the patient's wristband with the requisition for the EXACT information is sufficient. If patient does not have a wristband, but able to recite his/ her full name and full social security number, it is acceptable to draw all specimens with the exception of Blood Bank specimens.
   If there is any doubt of patient identification, nursing personnel should be asked to identify the patient and a new wristband should be placed on the patient.

4. The specimen may only be collected when the patient's proper identification has been established.

Outpatients

1. Before collecting any specimens, a laboratory request must be in the computer.

2. Each patient must be called upon individually by his or her name.

When the patient is in the phlebotomy room, the collector should ask the patient his/her full name and full Social Security number. If the patient is unable to give his/her full Social Security number, the collector must request to see the patients' VA Picture identification card. This should ensure proper identification of each patient. The collector should pay close attention to making sure the name and Social Security number matches what is printed on the labels or order sheet that he/ she has.

INTRODUCTION

SPECIMEN IDENTIFICATION

Every specimen coming to the laboratory must be properly labeled. This refers to ALL specimens including:

Blood collection tubes
Urine specimen containers
Culture Swabs
Blood Culture Bottles
Surgical Specimens
Cytology Specimens
Body Fluid Specimens

The patient identification label should be affixed directly to the bottle. **Never** affix labels to the lids of containers.

ALL specimens submitted to the laboratory must contain the following information on the label:

1. Patient's Full Name
2. Patient's Full Social Security Number
3. Date and Time of Collection
4. Source of Specimen (if applicable)
5. Initials of the Employee collecting the specimen

All specimens forwarded to the laboratory should be placed in a two-part plastic biohazard bag. Place the labeled specimen in the ziplock portion of the plastic transport bag. Fold the orders into the pocket of the bag.

ALL specimens **MUST** be accompanied with orders.

INTRODUCTION

CRITERIA FOR REJECTION OF UNSATISFACTORY SPECIMENS

Laboratory accuracy starts with a specimen that has been collected and handled properly. Recognizing this, the laboratory has established criteria for the rejection of unsatisfactory specimens. In the event that a specimen received by the Laboratory must be rejected, the ordering clinician will be notified. Documentation will be made in the comments of the computer that the clinician was notified and why the specimen was rejected.

However, for surgical and/or cytology specimens and for body fluids, the laboratory will make every effort to contact the collecting clinician to accurately identify the specimen. When the clinician can positively identify the specimen and knows the specimen cannot possibly from any other patient, the laboratory will allow the clinician to label the specimen. This process will be documented in the report in the computer.

The following is a list of criteria for rejection of unsatisfactory specimens:
The list does not pertain to body fluids, surgical and/ or cytology specimens.

1. Specimen Unlabeled
2. Specimen Mislabeled
3. Label illegibly written
4. Incomplete specimen identification
5. Specimen or container in which specimen was sent is grossly contaminated.
6. Specimen collected improperly
7. Specimen collected or submitted in improper container
8. Specimen of insufficient quantity
9. Sterility of specimen questionable
10. Specimen too long in transport
11. Specimen hemolyzed for a test where hemolysis will yield false results
12. Specimen clotted when it should not be
13. Specimens that should be frozen, received thawed
14. Specimen lacking preservative
15. Specimen containing improper preservative
16. Patient receiving medication which interferes with the test results
17. Patient not in a fasting state for tests requiring a fasting state
18. Patient not fasting for necessary period of time
19. Specimens received in a syringe.
    (For example: joint fluids must be transferred to a heparinized tube immediately)

INTRODUCTION

SPECIMEN TRANSPORT/ DELIVERY

FOR HOSPITAL WARDS

Specimen Container:

1. All specimens must be placed in a leakproof primary specimen container.

2. Care should be taken not to contaminate the outside of the primary container.

3. Plastic Bag: Before transporting to the laboratory, all specimens must be place into a plastic biohazard bag with a leakproof seal. Accompanying requisitions should be placed in the outside sleeve of the bag.

Delivery:

1. Transport specimens to the laboratory as soon as possible.

2. Certain tests require special immediate handling after collection. Refer to the test description option in the computer for appropriate handling and delivery requirements.

3. Time stamp all specimens (requisitions) delivered to the laboratory.

Communications:

1. Hand all CSF specimens directly to a laboratory staff member.

2. Notify laboratory personnel of the delivery of all STAT or time-dependent specimens

INTRODUCTION

SPECIMEN PROCESSING

FOR OUTPATIENT CLINICS

SERUM PREPARATION:

1. Obtain a venous blood specimen. The following tubes will provide a serum specimen:

2. Allow specimen to fully clot. Place a specimen vertically in a test tube rack as this will speed up the clotting action. When the clotting has completed, the blood will no longer "flow". The clotting should be complete after 15 –30 minutes depending on the type of tube and patient condition.

3. Centrifuge the specimen at 3200 – 3400 rpm's for a minimum of 10 minutes.

4. Serum should be separated from the red cells to avoid test interference. This should take place within one hour of collection. Always avoid red cell contamination.

5. Refrigerate specimens not tested immediately at 2 – 8 C, unless otherwise specified. Refrigerate only after specimens are centrifuged.

6. Avoid specimen agitation. Hemolysis (the breakdown of red blood cells) will occur when the specimen is agitated. Avoid shaking the specimen and always use gentle inversion to mix specimens.

7. Avoid specimen excess exposure to light. Certain analytes (bilirubin is the most noted) break down when exposed to light.

INTRODUCTION

SPECIMEN PROCESSING
FOR OUTPATIENT CLINICS

PLASMA PREPARATION:

1. Obtain a venous blood specimen. The following tubes will provide a plasma specimen:
   Lavender Top Tube containing EDTA
   Light Blue Top Tube containing Sodium Citrate
   Green Top Tube containing Sodium Heparin
   Green/ Gray Top Tube Lithium Heparin
2. Centrifuge the specimen at 3200 – 3400 rpm's for a minimum of 10 minutes.
3. Plasma should be separated from the red cells to avoid test interference. This should take place within on hour of collection. Carefully take off plasma with a disposal pipette, making sure not to enter the Buffy Coat of the specimen. Place plasma into a plastic pour off tube.

WHOLE BLOOD:

1. Obtain a venous blood specimen. The following tubes will provide a whole blood specimen:
   Lavender Top Tube containing EDTA
   Light Blue Top Tube containing Sodium Citrate
   Green Top Tube containing Sodium Heparin
2. If whole blood specimen is required, do not centrifuge.

HANDLING CONSIDERATIONS FOR BLOOD SPECIMENS

1. Keep the specimen tubes capped. This should be done for safety reasons as well as for specimen preservation.

2. Be sure to separate serum and plasma from the red cells prior to refrigeration.

INTRODUCTION

SPECIMEN PROCESSING

FOR OUTPATIENT CLINICS

SPECIMENS TO BE TRANSPORTED AS WHOLE BLOOD:

The following common tests are collected as whole blood and should be transported as whole blood. These tests will reach the laboratory the same day.

TEST	TUBE	SPECIMEN TYPE
CBC	Lavender, EDTA	Whole Blood
Hemoglobin A1C	Lavender, EDTA	Whole Blood
Protime	Light Blue, Sodium Citrate	Whole Blood
PTT	Light Blue, Sodium Citrate	Whole Blood

SPECIAL HANDLING FOR SOME SERUM SPECIMENS

The following common tests are collected in a plain red top tube. The specimen will be allowed to clot, then centrifuged. After centrifugation, the serum will be pipetted off into the proper plastic transport tube and properly labeled.

Therapeutic Drugs	Plain red	Serum

RANDOM URINE SPECIMENS:

Random urine specimens should be poured off into the proper conical shaped tube with the cap tightly secured.

URINE CULTURE SPECIMENS:

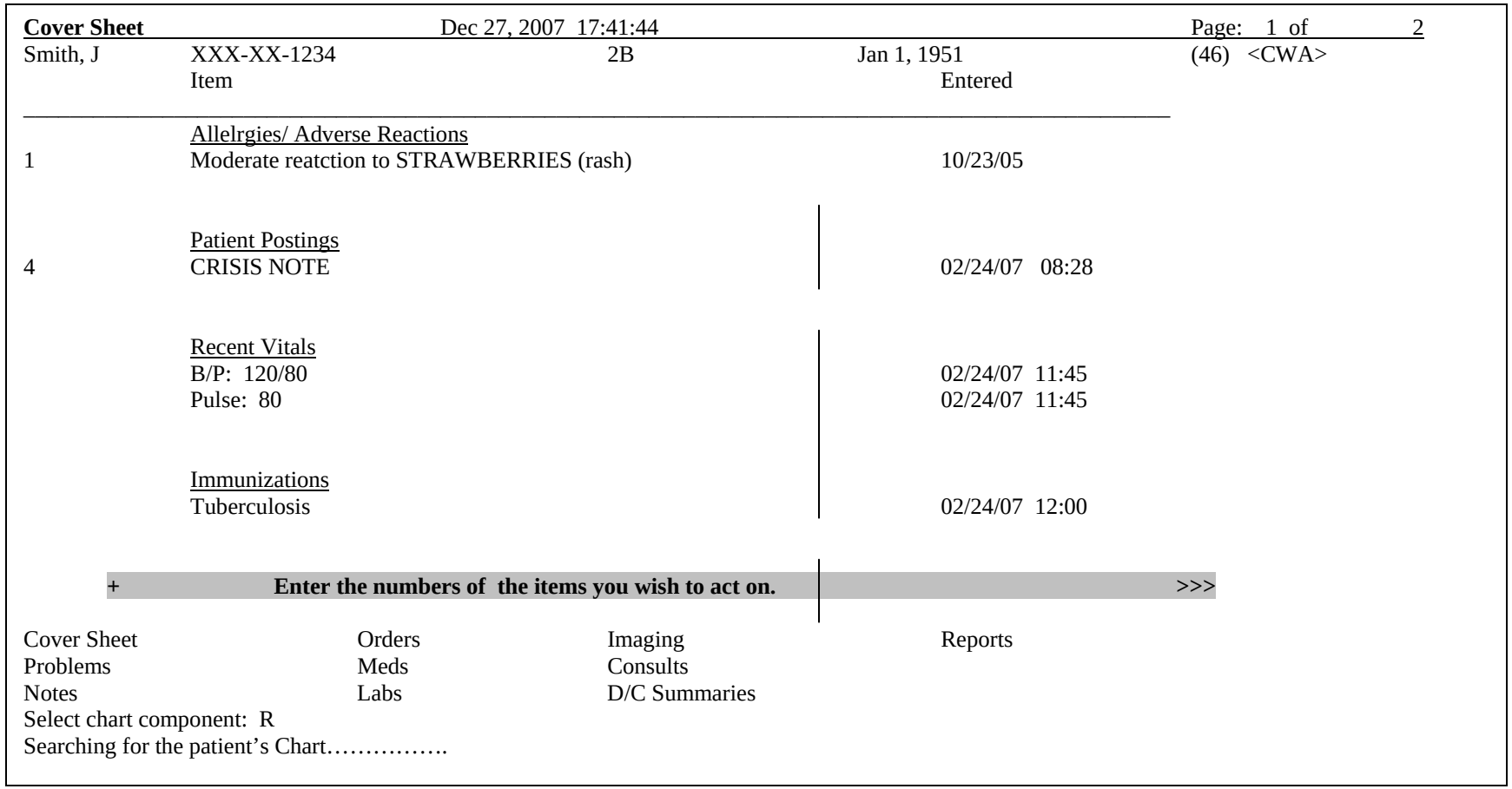
Urine culture transport kits are available. Using Asceptic Technique, simply insert the vacutainer system into the urine specimen. Put the vacutainer tube containing preservative on the system.

INTRODUCTION

REPORTS

You can view or print reports and results from either the Results Reporting option on the Clinician Menu or from the Reports tab on the Chart Contents Screen. The Reports tab only lets you print for individual patients. The RR option lets you select more than one patient at a time.

1. Select Chart Contents from the Cover Sheet
2. Select Reports from Chart Contents



Cover Sheet Dec 27, 2007 17:41:44 Page: 1 of 2

Smith, J XXX-XX-1234 2B Jan 1, 1951 (46) <CWA>

	Item	Entered
	Allelrgies/ Adverse Reactions	
1	Moderate reatction to STRAWBERRIES (rash)	10/23/05
	Patient Postings	
4	CRISIS NOTE	02/24/07 08:28
	Recent Vitals	
	B/P: 120/80	02/24/07 11:45
	Pulse: 80	02/24/07 11:45
	Immunizations	
	Tuberculosis	02/24/07 12:00

+ **Enter the numbers of the items you wish to act on.** >>>

Cover Sheet Orders Imaging Reports
Problems Meds Consults
Notes Labs D/C Summaries
Select chart component: R
Searching for the patient's Chart…….

INTRODUCTION

REPORTS

Reports Dec 28, 2007 16:24:28 Page: 1 of 2
Smith, J XXX-XX-1234 2B Jan 1, 1951 (46) <CWA>
Selected date range: 12/28/06 thru 12/28/07

	Report	Date	Status
1	Health Summary		
2	Adhoc Health Summary		
3	Vitals cumulative		
	Lab		
4	Lab Cumulative		
5	Lab Results by Day		
6	Lab Results by Test		
7	Lab Test Status		
8	Lab Graph		
9	Blood Bank Report		
10	Anatomic Path Report		
	Orders		
11	Daily Order Summary		

+ **Enter the numbers of the items you with to act on.** >>>>

OR Other Reports… CV Change View… SP Select New Patient
AD Add New Orders CC Change Contents… Q Close Patient Chart
Select: Next Screen// **<Enter>**

INTRODUCTION

REPORTS

```
Reports                    Dec 28, 2007  16:24:28                    Page:  2 of  2
Smith, J        XXX-XX-1234              2B              Jan 1, 1951   (46) <CWA>
                      Selected date range:  12/28/06 thru 12/28/07
              Report                                          Date          Status
   12         Order Summary for Date Range
   13         Custom Order Summary
   14         Chart Copy Summary
   15         Outpatient RX Profile

              Dietetics
   16         Dietetic Profile

              Imaging      (08/26/06 to 08/26/07,    Limit  10)

              Summary of Patient Procedures

+             Enter the numbers of the items you with to act on.          >>>>
OR  Other Reports…          CV  Change View…          SP  Select New Patient
AD  Add New Orders          CC  Change Contents…      Q   Close Patient Chart

Select:  Chart Contents//  2
```

INTRODUCTION

REPORTS

Lab Cumulative Example

```
Report Display                          Mar 27, 1997 17:44:44                    Page:  1 of  2
Smith, J        XXX-XX-1234                  2B              Jan 1, 1951              (46) <CWA>

Lab Cumulative

                                      ----  BLOOD BANK  -----
ABO  Rh:  A POS

        Unit assigned/ xmatched:                                    Exp date              Loc
 1)     V11111          CPDA-1  RED BLOOD  CE       A  POS         APR  28,  1995        Blood Bank
Component requests                    Units    Request Date          Date wanted      Requestor      By
CPDA-1  RED  BLOOD CELLS                4      03/29/95  16:33     03/29/95  16:33      KIL            DM
ACD-A  RED BLOOD CELLS                  2      02/22/95  16:29     02/23/95  08:00      BOB            DM

                                  |  ---------   AHG (direct)   --------|        |  ---AHG (indirect)------  |

      Date/time          ABO  Rh       POLY  IgG          Interpretation (Antibody screen)

+                  Enter?  For more help.                                                        >>>

+    Next Screen                    UP   Up a Line                  PS   Print Screen
-    Previous Screen                DN   Down a Line                PL   Print Data
FS   First Screen                   GO   Go to Page                 Q    Close
LS   Last Screen                    SL   Search List
Select Action:  Next Screen//  <Enter>
```

INTRODUCTION

RESULTS REPORTING

You can print reports for multiple patients (e.g., all of the patients in a ward, or all of the patients on a Personal or Team List) through the Results Reporting option on the Clinician Menu.

See the next page for the *Order summary for Date/ time Range Example*

Order Summary for Date/ Time Range Example

```
   OE          CPRS Clinician Menu
   RR          Results Reporting Menu
   AD          Add New Orders
   RO          Act on Existing Orders
   PP          Personal Preferences …..

Select Clinician Menu Option:    Results Reporting Menu

                                        1A  ward  list

1       DOE, WILLIAM C.          (6572)  A-2        9       REGISTER, N P            (9200)  B-2
2       FEET, SMELL E.  (1990)   -                  10      SCHWARTZ, ARNOLD         (9022)  -
3       HOOD, ROBIN              (2591)  -          11      SIMPSON, HOMER           (9999)  A-5
4       KIMINATOR, THE           (3241)  -          12      STONE, JERRY             (2432)  A-6
5       LAY, FRITO               (8333)  B-5        13      TRAT, JACK               (2342)  B-1
6       MUFFET, L M              (7689)  B-4        14      WINCHESTER, C E          (0167)  -
7       NEW, PATIENT             (1234)  -          15      ZORRO, MIGUEL    (1414)  B-3
8       NIVEK, SIGMA             (2379)  -

Select Patient (s):  12-13       STONE, JERRY       (2432)  A-6
                                 TRAT, JACK         (2342)  B-1

                                        R E S U L T S   R E P O R T I N G
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------
                                        ---Main  Results  Menu ---

1       Health Summary                                   8       Daily Order Summary
2       Lab Results (Interim)                            9       Order Summary for Date/ time Range
3       Graph lab Tests                                  10      Customized Order Summary
4       Blood Bank Report                                11      Print Chart Copy Summary
5       Anatomic Pathology Report                        12      Work Copy Summary
6       Vitals SF511 Report                              13      OUTPATIENT Pharmacy action profile
    7       Vitals Cumulative Report

Select Item (s):  9      Order Summary for Date/ time Range

                                        ----Order Summary for Date/ time Range-----

Start Date (Time):  T//  t-30   (OCT  26,  1997)

Ending Date (Time)   (inclusive):  OCT  26, 1997  23:59//  t    (NOV 25,  1997)

DEVICE;  HOME//   ALPHA
```

IMMUNOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTION
ANTIBODY TO EXTRACT NUCL AG	Immunodiffusion Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-DNA ANTIBODY	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-J01	Immunodiffusion Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-MITOCHONDRIAL ANTIBODY	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-PARIETAL CELL ANTIBODY	Fluorescent Antibody (FA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-SCLERODERMA ANTIBODY	Immunodiffusion Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-SM/ RNP	Immunodiffusion Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-SMOOTH MUSCLE ANTIBODY	Fluorescent Antibody (FA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-SSA/SSSB	Immunodiffusion Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
ANTI-THRYOID ANTIBODIES	Immunodiffusion	Yellow top tube – 1 ml serum	Negative	

IMMUNOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ASO TITER	Agglutination	Yellow top tube – 1 ml serum	Negative	
CELLULAR IMMUNE PROFILE	Flow Cytometry Philadelphia VA	One Lavender EDTA tube. Send results of CBC with differential.		
CD4+/ CD3+			594 – 1663	
CD8+/CD3+			272 – 932	
CD4%			32 – 60	
CD8%			13 – 40	
CD3%			61 – 84	
CD4/CD8 RATIO			1 – 3.1	
CMV ANTIBODY	Enzyme Immunoassay (EIA)	Yellow top tube – 1 ml serum	Negative	
H. PYLORI ANTIBODY	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
HAVAb-T (Hepatitis A Antibody – Total)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
HAV-IgM (Hepatitis A Anibody – IGM)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
HbcAb-T (Hepatitis B Core Antibody- Total)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
HBeAb (Hepatitis Be Antibody)	Enzyme Immunoasay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	

IMMUNOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
HBeAg (Hepatitis Be Angtigen)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
HBsAg (Hepatitis B surface Antigen)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 2 ml serum	Negative	
HCVAb (Hepatitis C Antibody)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube - 1 ml serum	Negative	
HCV GENOTYPE	LiPA Philadelphia VA	Two Lavender EDTA tubes Centrifuge & Separate Transfer to plastic transport tube Send **frozen plasma**	Must be ordered with HCV PCR Assay (HCV VIRAL LOAD)	
HCV VIRAL LOAD	PCR Philadelphia VA	Two Lavender EDTA tubes Centrifuge & Separate Transfer to plastic transport tube Send **frozen plasma**	Negative	
HIV Screen (needle Stick –source patient)	Microbiology	Yellow top tube – 1 ml serum	Negative	
INFULENZA A& B SCREEN	Microbiology	Yellow top tube – 1 ml serum	Negative	

IMMUNOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
HDVAb (Hepatitis D Antibody)	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1ml serum	Negative	
INFECTIOUS MONONUCLEOSIS	Agglutination Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
LYME DISEASE	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
NASAL SWAB FOR MRSA	PCR Microbiology	Nasal Swab	Negative	
RPR	Flocculation Philadelphia VA	Yellow top tube – 1 ml serum	Non-reactive	
RUBELLA ANTIBODY SCREEN	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Negative	
RUBEOLA ANTIBODY SCREEN	Enzyme Immunoassay (EIA)	Yellow top tube – 1ml serum	Negative	
TOXOPLASMA ANTIBODY SCREEN	Enzyme Immunoassay (EIA) Philadelphia VA	Yellow top tube – 1 ml serum	Non-Reactive	
VDRL – CSF	Agglutination Philadelphia VA	Cerebral Spinal Fluid – 1 ml	Non-Reactive	

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ACTIVATED PROTEIN C RESISTANCE (APCR)	Measures addition of aPC on the APTT Reference Laboratory	Blue top tube – Citrated plasma Centrifuge and send **frozen plasma**	> 2.0	
ANTI THROMBIN III	Reference Laboratory	Blue top tube – Citrated plasma Centrifuge and send **frozen plasma**	Adults: 39 – 89%	
APTT	STA Mechanical Clauss Coagulation	Blue top tube – citrated plasma	22.6 – 35.5 seconds Heparin Therapy: 0.3 – 0.7 Xa U 66 – 103 seconds 0.1 – 0.3 Xa U 48 – 66 seconds	
BLEEDING TIME	Surgicut Method Coagulation	N/A	2.7 – 8.0 minutes	Patient should not be on aspirin therapy for 10 days

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CBC WITH DIFF *(5 part auto diff)*	Coulter Principle Hematology	Lavender EDTA tube – whole blood		
WBC			M&F: 4.8 – 10.8 thousand/cumm	
RBC			M: 4.7 – 6.1 million/cumm F: 4.2 – 5.4 million/cumm	
HGB			M: 14.0 – 18.0 g/dl F: 12.0 - 16.0g/dl	
HCT			M: 42.0 – 52.0% F: 37.0 – 47.0%	
MCV			M: 80 – 94 u/cmm F: 81 – 99 u/cmm	
MCHC			M&F: 33.0 – 37.0 g/dl	
RDW			M&F: 11.5 – 14.5%	
PLATELET			M&F: 130 – 400 thousand/cumm	
MPV			M&F: 7.4 – 10.4 u/cmm	
NEUTROPHIL – BANDS			1 – 6%	
NEUTROPHIL –SEGS			40 – 60%	
LYMPHOCYTES			28 – 42%	
MONOCYTES			1 – 8%	
EOSINOPHILS			1 – 5%	
BASOPHILS			0 – 1%	
ABSOLUTE NEUTROPHIL#			1.9 – 6.6 K/cmm	
ABSOLUTE LYMPHOCYTE#			1.3 – 4.6 K/cmm	
ABSOLUTE MONOCYTE#			0.0 – 0.9 K/cmm	
ABSOLUTE EOSINOPHIL#			0.0 – 0.6 K/cmm	
ABSOLUTE BASOPHIL#			0.0 – 0.1 K/cmm	

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CELL COUNT Cerebrospinal Fluid	Microscopic Examination Hematology	Sterile tube with CSF #3 or #4 tube	0 – 10 cells Segmented cells: 0 Lymphocytes: 0 – 10 cells	
All other Fluids	Microscopic Examination Hematology	Green top tube – Heparinized		
D-DIMER	Quantitative Latex Particles Coagulation	Blue top tube – Citrated plasma	<0.27 µg/ml (FEU)	
EOSINOPHILIC COUNT, TOTAL	Absolute Count Hematology	Lavender EDTA tube – whole blood	M&F: 0 – 450/mm	
FACTOR II ASSAY	One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 75 – 130%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
FACTOR V ASSAY	One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 60 - 140%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
FACTOR V LEIDEN MUTATION	Allele-specific PCR Reference Laboratory	Lavender EDTA tube –whole blood Maintain specimen at Room Temperature	Mutation Absent	

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
FACTOR VII ASSAY	One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 50 - 150%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
FACTOR VIII ASSAY	One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 50 - 150%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy For 2 days prior to test
FACTOR VIII INHIBITOR SCREEN	Time-temperature dependent Factor VIII Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	No Inhibitor	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
FACTOR IX ASSAY	PTT – based One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 50 - 150%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy For 2 days prior to test
FACTOR X ASSAY	PTT – based One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 65 - 140%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy For 2 days prior to test
FACTOR XI ASSAY	PTT – based One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 60 - 135%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy For 2 days prior to test

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
FACTOR XII ASSAY	PTT – based One-Stage Clotting Time Assay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: 50 - 150%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy For 2 days prior to test
FACTOR XIII ASSAY	Clot Solubility Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Normal	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
FIBRINOGEN	Quantitative Clauss	Blue top tube – Citrated plasma	225 – 485 mg/dl	
LUPUS ANTICOAGULANT	Clot-based Assay Reference Laboratory	Blue top tube- Citrated plasma Centrifuge and send **frozen plasma**		Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
PLAMINOGEN	Reference Laboratory	Blue top tube – Citrated plasma Centrifuge and send **frozen plasma**	Adults: 78 – 130%	
PROTEIN C ANTIGEN	Enzyme Immunoassay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: >70%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test
PROTEIN S ANTIGEN (Includes Total Protein S and Free Protein S)	Enzyme Immunoassay Reference Laboratory	(2) Blue top tubes – Citrated plasma Centrifuge and send **frozen plasma** Do not send Hemolyzed specimens	Adults: Total Protein S: 58 – 150% Free Protein S: 56 – 124%	Patient should avoid Coumadin therapy for 2 weeks and heparin therapy for 2 days prior to test

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
PROTHROMBIN TIME	STA Mechanical Clauss Coagulation	Blue top tube – Citrated plasma	11.7 – 14.3 seconds INR: 0.9 – 1.1 seconds **Coumadin:** Ambulatory Surgery INR < 1.5 PT≤ 18.0 **DVT and PE, Tissue Heart Valves** **Acute MI, Atrial Fibrillation** INR: 2.0 – 3.0 PT: 22.6 – 31.1 **Mechanical Heart Valve** **Recurrent MI** INR: 2.5 – 3.5 PT: 27 – 35.1	
RETICULOCYTE COUNT	Coulter Method Hematology	Lavender EDTA tube – whole blood	0.5% - 1.5%	

HEMATOLOGY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
SEDIMENTATION RATE (ESR)	Westergren	Black top tube – whole blood (1.2 ml sodium citrate tube)	Males < 50 yrs: 0 – 15mm Males > 50 yrs: 0 – 20 mm Females < 50 yrs: 0 – 20 mm Females > 50 yrs: 0 – 20 mm	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
1,25-DIHYDROXY VITAMIN D	Column Chromatography Radioimmunoassay (RIA) Reference Laboratory	Yellow top tube – 1 ml serum	15.9 – 55.6 pg/ml	
11-DEOXYCORITISOL	Radioimmunoassay (RIA) Reference Laboratory	Yellow top tube – 1 ml serum	Baseline: < 8 ng/ml Post-Metapyrone: 80 – 250 ng/ml	
17 KETOGENIC STEROIDS	Spectrophotometry Zimmerman Reaction Reference Laboratory	24 Hr. urine 30 ml 6N HCL	Male >14 years: 5 – 23 mg/ 24 hr Female >14 yrs: 3 – 15 mg/ 24 hr	Indicate patient's sex State 24 Hr. Urine Volume
17 KETOSTEROIDS, TOTAL	Drekter/ Zimmerman Modified Reaction Reference Laboratory	24 Hr. urine 30 ml 6N HCL	Male > 16 years: 10 – 25 mg/ 24 hr Female > 16 yrs: 6 – 14 mg/ 24 hr	Indicate patient's sex State 24 Hr. Urine Volume
17 HYDROXYCORTICOSTEROIDS	Porter-Silber Method Reference Laboratory	24 Hr. urine 30 ml 6N HCL	Male > 18 years: 3 – 10 mg/ 24 hours Female > 18 yrs: 2 – 8 mg/ 24 hours	State 24 Hr. Urine Volume
5' NUCLEOTIDASE	Kinetic Reference Laboratory	Yellow top tube – 1 ml serum	2 – 10 IU/ L	
5-HIAA	High-pressure liquid chromatography (HPLC) with electrochemical detection (EC) Reference Laboratory	24 Hr. urine -No preservative Also acceptable: 30 ml 6N HCL	0 – 8 mg/24 hours	State 24 Hr. Urine Volume
ACETAMINOPHEN	Turbidometric Inhibition Immunoassay Philadelphia VAMC	Red top tube – 1 ml serum	Therapeutic: 10 – 20 mcg/ml Toxic: > 150 mcg/ml – 4 hours ingestion	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ACETONE	Nitroprusside Reaction Chemistry	Yellow top tube – 1 ml serum	Negative	
ACETYLCHOLINE RECEPTOR	Kinetic Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0.00 – 0.24 nmol/L Borderline: 0.25 – 0.20 nmol/L Positive: > 0.40 nmol/L	
ACTH	Electrochemiluminometric Immunoassay (ECLIA) Reference Laboratory	Iced Lavender EDTA tube Centrifuge and send 2 ml frozen plasma	7.2 – 63.3 pg/ml	
ALBUMIN	Colorometric – Endpoint Chemistry	Yellow top tube – 1 ml serum	3.2 – 5.5 g/f;	
ALCOHOL	Photometric Chemistry	Unstoppered Red top – 1 ml serum Do not use Alcohol when drawing Sample	< 5.0 mg/dl	
ALDOLASE	Kinetic – 340 nm Reference Laboratory	Yellow top tube –1 ml serum	1.2- 7.6 units/ L	
ALDOSTERONE	Radioimmunoassay Reference Laboratory	Yellow top tube – 1 ml serum	Adults: Average Sodium Diet Recumbent: 1.0 – 6.0 ng/dl Standing: 40 – 31.0 ng/dl Adrenal vein: 200.0 – 800.0 ng/dl	
ALKALINE PHOSPHATASE	Kinetic Rate Chemistry	Yellow top tube – 1 ml serum	42 – 121 IU/L	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ALKALINE PHOSPHATASE ISOENZYMES	Electrophoresis Reference Laboratory	(2) Yellow top tubes – 4 ml serum Refrigerate specimen as soon as possible	Liver: 15% - 88% Bone: 12% - 85% Intestine: 0% - 6%	
ALPHA-1-ANTITRYPSIN	Immunologic Reference Laboratory	Red top tube – 1 ml serum Centrifuge, separate and store refrigerated	90 – 200 mg/dl	Overnight Fasting is Preferred
ALPHA-1-ANTITRYPSIN	Isoelectric Focusing Immunologic Reference Laboratory	Red top tube – 1 ml serum Centrifuge, separate and store refrigerated	Intrepretation will accompany report	Overnight Fasting is Preferred
ALPHA- FETOPROTEIN	Philadelphia VA	Yellow top tube – 1 ml serum	0.0 – 7.51 ng/dl	
ALPHA-GALACTOSIDASE	Enzymatic Activity Reference Laboratory	(2)Yellow ACD tubes – 5 ml whole blood Refrigerate after collection	28.0 – 80.0 nmol/ hour/ mg protein	
ALT	Kinetic Rate Chemistry	Yellow top tube – 1 ml serum	10 – 60 IU/L	
ALUMINUM	Atomic Absorption Spectrometry Reference Laboratory	Red top tube – 2 ml serum Centrifuge, separate and refrigerate	Environmental Exposure: 0 – 9 µg/L Dialysis patients: <40 µg/L	
AMIKACIN	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge, separate and refrigerate	Therapeutic: Trough: 1.0 – 8.0 µg/ml Peak: 20.0 – 30.0 µg/ml	Trough: draw prior to next dose Peak: draw 60 min after IM injection; 30 min after 30 min

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
AMIODARONE	High-Pressure Liquid Chromatography Reference Laboratory	Red top tube – 1 ml serum Centrifuge, separate and refrigerate	Therapeutic: Amiodarone: 1.0 – 2.5 µg/ ml Noramiodarone: 1.0 – 2.5 µg/ ml	
AMITRIPTYLINE & NORTRIPTYLINE	High-Pressure Liquid Chromatography Reference Laboratory	Red top tube – 1 ml serum Centrifuge, separate and refrigerate	Nortriptyline: 20 – 150 ng/ml Amitriptyline & Nortriptyline: 120 – 250 ng/ml	
AMMONIA	Timed Endpoint Reference Laboratory	Lavender EDTA tube on ice	Adults: 10.0 – 65.0 UMOL/L	
AMYLASE	Enzymatic Rate Chemistry	Yellow top tube – 1 ml serum	25 – 125 U/L	
AMYLASE, urine	Enzymatic Rate Chemistry	Urine – 20 ml – Random	None	
AMYLASE, ISOENZYMES	Cellulose Acetate Electrophoresis Reference Laboratory	Yellow top tube – 1 ml serum	Salivary: 0 – 70% Pancreatic: 0 – 55%	
ANDRISTENEDIONE	Radioimmunoassay (RIA) Reference Laboratory	Red top tube – 1 ml serum Centrifuge, separate and refrigerate	Adult Male: 57 - 265 ng/dl Female: 47 – 268 ng/dl	
ANGIOTENSION CONVERTING ENZYME (ACE)	Kinetic Reference Laboratory	Yellow top tube – 2 ml serum	> 14 years: 12 – 68 units/L	Stop administration of captopril, enalapril or lisinopril for 12 hours Prior to venipuncture

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ANTIADRENAL CORTEX ANTIBODIES	Indirect Fluorescent Antibody (IFA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: <1:10	
ANTICARDIOLIPIN ANTIBODIES	Enzyme-linked immunosorbent assay (ELISA) Reference Laboratory	Yellow top tube – 1 ml serum	IgG: 0 – 10GPL IgA: 0 – 12 APL IgM: 0 – 9 MPL	
ANTI-CENTROMERE ANTIBODY	Multiplex flow immunoassay Reference Laboratory	Yellow top tube – 1 ml serum	0 – 0.9 AI	
ANTIDIURETIC HORMONE	Radioimmunoassay Reference Laboratory	(1) Yellow top tube – 1 ml serum (2) Lavender EDTA tubes – plasma Centrifuge all tubes. Separate Serum and send. Separate plasma And send 2 ml frozen plasma	0 – 8 pg/ml	
ANTI-dsDNA (Double-Stranded) ANTIBODIES	Flow Cytometry Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0 – 99 units/ml	
ANTI-ssDNA (Single-Stranded) ANTIBODIES	Enzyme Immunoassay Reference Laboratory	Yellow top tube – 1 ml serum	Negative: <20 units/ml	
ANTI-ENA (Anti-Extractable Antibodies)	Multiplex flow immunoassay Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0 – 0.9 AI	Includes Anti-RNP & Anti-Smith
ANTI-GLOMERULAR BASEMENT MEMBRANE ANTIBODIES	Enzyme Immunoassay Reference Laboratory	Yellow top tube – 1 ml serum	0.0 – 3.0 U/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ANTIHISTONE ANTIBODIES	Enzyme-linked immunosorbent assay (ELISA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: < 1.0 units Weak Pos: 1.0 – 1.5 units Med Pos: 1.6 – 2.5 units Strong Pos: > 2.5units	
ANTIMYOCARDIAL ANTIBODIES	Indirect fluorescent Antibody (IFA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: < 1:20	
ANTINEUTROPHIL CYTOPLASMIC ANTIBODIES (ANCA)	Indirect fluorescent Antibody (IFA) Reference Laboratory	Yellow top tube – 2 ml serum	Negative: 1:40	
ANTI-PARIETAL CELL ANTIBODIES	Enzyme-Linked Immunosorbent Assay (ELISA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0 – 20	
ANTI-PLATELET ANTIBODIES	Hemagglutination Reference Laboratory	Yellow top tube – 2 ml serum	Negative	
ANTI-SCLERODERMA ANTIBODIES	Multiplex flow immunoassay Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0 – 0.9 AI	
APOLIPOPROTEIN	Immunologic Reference Laboratory	(2) Yellow top tubes – 4 ml serum	See Interpretative Report	
ARSENIC	Inductively coupled plasma-Mass Spectrometry (ICP-MS) Reference Laboratory	Royal Blue – Whole Blood	2 – 23 µg/L	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ARYLSULFATASE A	Enzymatic Activity Reference Laboratory	(2) Yellow ACD Tubes – 10 ml whole blood	25 – 90 nmol/ hour/ mg protein	Collect only M - F
AST	Enzymatic Rate Chemistry	Yellow top tube – 1 ml serum	10 – 42 IU/L	
BETA 2- GLYCOPROTEIN I ANTIBODIES	Enzyme-linked immunosorbent Assay (ELISA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: <20 units	
BETA 2-MICROGLOBULIN SERUM	Two-site Chemiluminescent enzyme immunometric assay Reference Laboratory	Yellow top tube – 1 ml serum	1.0 – 1.7 mg/dl	
BILE ACIDS	Enzymatic Reference Laboratory	Yellow top tube – 1 ml serum	0 – 8.1 µmol/L	Patient should be fasting
BILIRUBIN, TOTAL	Timed Endpoint Chemistry	Yellow top tube – 1 ml serum	0.2 – 1.0 mg/dl	
BILIRUBIN, DIRECT	Timed Endpoint Chemistry	Yellow top tube – 1 ml serum	0.0 – 0.2 mg/dl	
BLASTOMYCES ANTIBODIES	Double-immunodiffusion (DID) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: $\leq$ 1:1	
BROMIDE	Reference Laboratory	Red top tube – 1 ml serum		

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
B-TYPE NATRIURETIC PEPTIDE (BNP)	Immunoenzymatic Chemistry	Lavender EDTA tube – 1 ml plasma Send whole blood (lavender tube)	≤ 100 pg/ ml	
C1 ESTERASE INHIBITOR	Immunologic, Quantitative Reference Laboratory	Red top tube on ice – Clot on ice	12 – 25 mg/dl	
CA 19-9	Enzyme Immunoassay (EIA) Reference Laboratory	Yellow top tube – 1 ml serum	0 – 37 units/ ml	
CA-125	Microparticle Enzyme Immunoassay (MEIA) Reference Laboratory	Yellow top tube – 2 ml serum	0.0 – 35.0 U/ML	
CADMIUM (SERUM)	Inductively coupled plasma-mass Spectrometry (ICP-MS) Reference Laboratory	Royal Blue Stopper (EDTA) tube Submit original tube	Environmental Exposure: Non-smoker: 0.3 – 1.2 µg/L Smoker: 0.6 – 3.9 µg/L Occupational exposure: 5.0 µg/L	
CADMIUM (URINE)	Inductively coupled plasma-mass Spectrometry (ICP-MS) Reference Laboratory	Urine: 20 ml random or 24 hr. No preservative. Room Temperature	Environmental Exposure: < 2.0 µg/g creatinine < 3.0 µg/ 24 hrs. Occupational exposure: 3.0 µg/g creatinine	State Volume for 24 hr.
CALCITONIN	Immunochemiluminometric Assay (ICMA) Reference Laboratory	Yellow top tube – 2 ml serum	Male: ≤ 11.5 pg/ml Female: ≤ 4.6 pg/ml	
CALCIUM (SERUM)	Ion Selective Electrode	Yellow top tube – 1 ml serum	7.7 – 9.9 mg/dl	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CALCIUM (URINE)	Indirect Potentiometry Philadelphia VAMC	24 Hr. Urine container – 30ml 6N HCL	100 – 300 mg/ 24 Hrs.	State Volume for 24 Hr.
CANCER ANTIGEN 27.29	Immunochemiluminometric Assay (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	0 – 38.6 units/ml	
CARBAMAZEPINE	Turbidimetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & separate; send serum	Therapeutic Range: Trough: 4 – 12 µg/ ml	Trough levels should be drawn immediately before the next dose
CARBON DIOXIDE	pH rate of change Chemistry	Yellow top tube – 1 ml serum	21 – 31 mmol/L	
CARCINOEMBRYONIC ANTIGEN (CEA)	Chemiluminescent Immunoassay Philadelphia VAMC	Yellow top tube – 1 ml serum	Non-smokers: 0 – 3 ng/ml Smokers: 0 – 10 ng/ml	
CARNITE, TOTAL & FREE	Turbidimetry Reference Laboratory	Yellow top tube – 2 ml frozen serum Centrifuge & Separate. Send **Frozen serum**	Total: 24 – 100µmol/L Free: 20 -88 µmol/L	
CAROTENE	High Pressure liquid Chromatography (HPLC) Reference Laboratory	Yellow top tube – 2 ml serum Specimen Must be protected from Light	10 – 85 µg/ dl	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CATECHOLAMINES, PLASMA	High-pressure liquid Chromatography (HPLC) With Electrochemical detection Reference Laboratory	(2) Lavender EDTA tubes Centrifuge and separate. Send **frozen plasma**	Total: <643 pg/ ml Epinephrine: < 100 pg/ml Norephinephrine: <400 pg/ml Dopamine: <143 pg/ml	Patients should be fasting for 4 or more hours Walnuts, bananas, and alpha methyldopa should be avoided for 1 week prior to sampling. Avoid Stress. Patient should be Supine for 30 minutes Prior to sampling
CATECHOLAMINES, FRACTIONATED URINARY	High-pressure liquid Chromatography (HPLC) with Electrochemical detection Reference Laboratory	Urine, 24-Hour w 30 ml 6N HCL	Epinephrine: 0 – 20 µg/24 hr Norephinephrine: 0 – 135µg/24 hr	Patient Stress should be avoided. Reserpine, alpha methyldopa, levodopa, Monoamine oxidase Inhibitors, and sympatho-Mimetic amines should be Discontinued 2 weeks Prior to collection State Volume for 24 hr.
CERULOPLAMIN	Immunologic Reference Laboratory	Red top tube on ice – 1 ml serum Centrifuge & separate. Freeze Serum.	Male: 16.2 – 35.6 mg/dl Female: 17.9 – 53.3 mg/dl	
CHLORIDE, Serum	Ion Selective Electrode, (ISE) Direct Chemistry	Yellow top tube – 1 ml serum	101 – 111 mmol/L	
CHLORIDE, 24 HR.	ISE, Direct Chemistry	24 hour urine – no preservative	110 – 250 mmol/ 24 hrs.	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CHLORIDE, CSF	ISE, Direct Chemistry	1 ml Cerebrospinal Fluid	118 – 132 mmol/L	
CHLORIDE, URINE	ISE, Direct Chemistry	Random Urine – 20 ml	None	
CHOLESTEROL	Colormetric – Endpoint Chemistry	Yellow top tube – 1 ml serum	140 – 200 mg/dl	
CHOLINESTERASE	Spectrophotometry (Ellman)-Kinetic Reference Laboratory	Yellow top tube – 1 ml serum	1900 – 3800 units/L	
CHROMIUM	Atomic Absorption Spectrometry Reference Laboratory	Royal Blue EDTA tube (Heavy Metals Free tube) Centrifuge and separate plasma Transfer plasma to plastic transfer Tube	Environmental Exposure: 0.1 – 2.1 µg/L	
CHROMOSOME ANALYSIS	FISH test will be applied as Reference Laboratory	Green Top Sodium Heparin Tube 5 ml Maintain specimen at room temperature	Report will show interpretations	
CITRIC ACID (CITRATE), URINE	Spectrophotometry (kinetic at 340 nm) Reference Laboratory	24 Hr. Urine w 30 ml 6 N HCL	320 – 1240 mg/ 24 hours	State Volume for 24 hrs.
CK-MB	Immunoenzymatic Reference Laboratory	Green/ Gray top tube – 1 ml plasma	0 – 5 ng/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CLONAZEPAM	High-Pressure Liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 4 ml serum Centrifuge and separate	Therapeutic: 15 – 60 ng/ml	
CLOZARIL	High-Pressure Liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 3 ml serum Centrifuge and separate	Therapeutic: Peak: 102 – 771 ng/ml Trough: 41 – 343 ng/ml	Peak is drawn 2.5 hours after last dose. Trough is drawn just before dose
CMV, IGG	Chemiluminescence Reference Laboratory	Yellow top tube – 1 ml serum	Negative: <0.9 units/ ml	
CMV, IGM	Enzyme Immunoassay (EIA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: ≤ 0.9	
COBALT	Inductively-coupled plasma-mass Spectrometry (ICP-MS) Reference Laboratory	Royal Blue Top EDTA tube Centrifuge and separate plasma Transfer plasma to plastic transfer Tube; Maintain specimenat room Temperature	Environmental Exposure: <1.0 µg/ml Occupational Exposure: 1.0 µg/ml	For Occupational Exposure, sampling time is end of shift at end of work week
COCCIDIOIDES ANTIBODIES	Double immunodiffsion (DID) Reference Laboratory	Yellow top tube – 1 ml	Negative: <1:1	
COMPLEMENT C2	Immunologic Quantitation by Radial immunodiffusion (RID) Reference Laboratory	Red top tube – 1 ml serum Centrifuge and separate **Freeze Serum** immediately	1.6 – 4.0 mg/dl	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
COMPLEMENT C3	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	88 – 201 mg/dl	
COMPLEMENT C4	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	16 – 47 mg/dl	
COMPLEMENT, TOTAL	Quantitative liposome lysis by Spectrophotometry Reference Laboratory	Yellow top tube – 1 ml serum	22 – 60 U/ml	
COPPER	Atomic Absorption Spectrometry Or inductivity coupled plasma - Mass spectrometry Reference Laboratory	Yellow top tube – 1 ml serum	Environmental Exposure: 70 – 155 µg/dl	
CORTISOL	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	8.7 – 22.4 µg/dl	
CORTISOL STIMULATION	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum for each sample: Baseline, 30 minutes & 60 minutes	See interpretation of results	Baseline is drawn prior to injection; 30 minutes post injection; 60 minutes post injection
C-PEPTIDE (SERUM)	Immunochemiluminometric (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	0.9 – 4.0 ng/ml	
CPK	Enzymatic Rate Chemistry	Green/ Grey top tube – 1 ml plasma	25 – 149 IU/L	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
C-REACTIVE PROTEIN	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	≤ 0.80 mg/dl	
CREATININE (SERUM)	Modified Jaffe Chemistry	Yellow top tube – 1 ml serum	0.5 – 1.2 mg/dl	
CREATININE, 24 HR. URINE	Modified Jaffe Chemistry	24 Hr. Urine No preservative	Males: 800 – 2000 mg/ 24 hr Females: 600 – 1800 mg/24 hr	State Volume for 24 hrs
CREATININE, URINE	Modified Jaffe Chemistry	Random Urine – 20 ml		
CRYOGLOBULIN	Precipitation and Immunofixation Philadelphia VA	3 Red top tubes collected in warm H20	Negative	
CYANIDE	Gas Chromatography Reference Laboratory	Lavender EDTA tube submit original full unopened tube	Environmental exposure: None detected	
CYCLOSPORINE	Immunoassay or High-Pressure liquid chromatography/ Tandem mass spectrometry (HPLC-MS/MS) Reference Laboratory	Lavender EDTA tube whole blood	Therapeutic: 100 – 300 ng/ml Organ Transplantation: Renal transplant: 100 – 250 ng/ml Liver transplant: 100 – 400 ng/ml Cardiac transplant: 100 – 400 ng/ml Bone Marrow transplant: 200 – 300 ng/ml	
CYCLIC CITRULLINATED PEPTIDE ANTIBODIES (CCP), IgG/ IgA	ELISA	1 yellow top tube – 1 ml serum	Negative: > 20 units Weak Pos: 20 – 39 units Moderate Pos: 40-50 units Strong Pos: > 59	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
CYSTINE, QUANTITATIVE	Spectrophotometry Reference Laboratory	24 Hr. Urine, **frozen**	10 –100 mg/ 24 hours	State Volume for 24 hr
DHEA-S	Two site chemiluminescent Enzyme immunometric assay Reference Laboratory	Yellow top tube – 1 ml serum	80 – 560 mcg/dl	
DIGOXIN	Turbidimetric Inhibition Chemsitry	Red top tube – 1 ml serum Centrifuge & separate- send serum	Therapeutic Range: 0.8 – 2.0 ng/ml	Specimens should not be collected Sooner than 5 -6 hrs After dose is admin-istered.
DILANTIN	Turbidimetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic Range: 10 – 20 mcg/ml	Trough levels should be collected Prior to next dose
DESIPRAMINE, SERUM	High-Pressure liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic Range: 150 – 250 ng/ml	Trough levels should be collected prior to next dose
DIAZEPAM	High-Pressure liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic Range: Diazepam + Nordiazepam: 0.1 – 2.5µg/ml	Oral: Peak: 1 hour after dose; IV: Peak 15 min after dose
DIPHTHERIA ANTITOXOID	Enzyme Immunoassay (EIA) Reference Laboratory	Yellow top tube – 1 ml serum	Non-protective: <0.1 IU/ml Protective: ≥ 0.1 IU/ml	
DISOPYRAMIDE	Gas Chromatography (GC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate- send serum	Therapeutic: 2.0 – 5.0 µg/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
DOXEPIN	High-Pressure liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic: Doxepin + Nordoxepin: 150 – 250 ng/ml	
DRUG SCREEN, URINE Panel includes: Ethanol, Amphetamine, Barbituate, Benzodiazepines, Cannabinoids, Cocaine, Methodone, Opiate, Oxycodone, Phencyclidine, Propoxyphene	Enzyme Immunoassay (EIA) Chemistry for all tests except Oxycodone performed Philadelphia VA	Random Urine – 20 ml	None Detected for all tests	
EPSTEIN BARR VIRUS	Enzyme Immunoassay (EIA) Reference Laboratory	(2) Yellow top tubes- 3 ml serum Maintain specimen at room temperature	Negative	
ERYTHROPOIETIN	Immunochemiluminometric (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	Adults: 4.2 – 27.8 mIU/ml	
ESTRADIOL	Immunochemiluminometric (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	Males: < 54 pg/ml Menstruating female: See interpretative report	
ESTROGEN, TOTAL	Radioimmunoassay (RIA) Reference Laboratory	(2)Yellow top tubes – 4 ml serum	See interpretative report for ranges	
ESTONE	Radioimmunoassay (RIA) Reference Laboratory	Yellow top tube – 1 ml serum	See interpretative report for ranges	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ETHANOL, SERUM	Photometric Chemistry	Unstoppered Red top tube – 1 ml serum	<5.0 mg/dl	Do not use alcohol when drawing sample
ETHYLENE GLYCOL	Gas Chromatography (GC) Reference Laboratory	Unstoppered Yellow top tube submit original **unopened** tube	None detected (<0.5mg/dl)	
FATTY ACIDS, FREE	Colorimetric Reference Laboratory	Yellow top tube – 1 ml serum	<0.1 – 0.6 mEq/L	
FEBRILE AGGLUTININS	Agglutination Reference Laboratory	Yellow top tube – 3 ml serum	Negative: <1:80	
FECAL FAT, QUALITATIVE	Sudan IV Stain Reference Laboratory	Random: Fresh stool, no preservative	Total Fats: Normal: <100 droplets/hpf Neutral Fats: Normal: <60 g of fat	Patient should be on a diet containing 60 g of fat. Do not use suppositories
FECAL FAT, QUANTITATIVE	Extraction/ Spectrophotometry Reference Laboratory	Stool Collection for 72 hours; Cans available for collection	Adults: < 7.0 g/ 24 hours	Patient should be on a standard diet containing 50 – 150g of fat/ day for At least 3 days prior to collection
FELBAMATE, SERUM	Gas Chromatography (GC) Reference Laboratory	Red Top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic: 25 – 104 µg/ml	
FERRITIN	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	Males: 23.9 – 336.2 ng/ml Females: 11.0 – 306.8 ng/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
FLECAINIDE	High-Pressure Liquid Chromatography (GC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic: 0.2 – 1.0 µg/ml	
FOLATE	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	3 – 20 ng/ml	
FOLATE, RBC	Immunochemiluminometric Assay (ICMA)	(2) Lavender top tubes.	46 – 1258 ng/ml	Transfer 7m from whole blood into plastic transfer Tube and freeze. Refrig Second tube.
FREE DILANTIN	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate – send serum	Therapeutic: 1.0 – 2.0 µg/ml	Draw specimen just prior to next dose
FREE LIGHT CHAINS, SERUM	Immunologic Reference Laboratory	1 Yellow top tube – 1 ml serum	Free Kappa Lt chains: 3.3-14.9mg/L Free Lambda Lt Chains: 5.71 – 26.3 mg/L Kappa/ Lambda Ratio: 0.26-1.65	
FREE T3 (FT3)	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	2.30 – 6.79 pg/ml	
FREE T4 (FT4)	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	0.58 – 1.64 ng/ml	
FRUCTOSAMINE	Colorimetric Reference Laboratory	Yellow top tube – 1 ml serum Maintain specimen at room temperature		

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
FSH	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	Males: 1.27 – 19.26 mIU/ml Females: Mid Follicular: 3.85 – 8.78 Mid Cycle Peak: 4.54 – 22.51 Mid-Luteal: 1.79 – 5.12 Postmenopausal: 16.74 – 113.59	
FUNGAL ANTIBODIES	Double Immunodiffusion Reference Laboratory	Yellow top tube – 1 ml serum	Negative	
GAMMA GT	Enzymatic Rate Reference Laboratory	Yellow top tube – 1 ml serum	7 – 64 IU/L	
GASTRIN	Immunochemiluminometric Assay (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	> 16 years ofd: 0 – 115 pg/ml	
GENTAMICIN	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge & Separate- send serum	Therapeutic: Peak: 6.0 – 10.0 µg/ml Trough: 0.5 – 1.5 µg/ml	Peak & Trough levels should be monitored Peaks should be drawn 45 – 60 min after IM Injection and 30 min After 30 IV dose. Troughs are drawn just Prior to the next dose
GLUCAGON, PLASMA	Radioimmunoassay (RIA) Reference Laboratory	Lavender EDTA tube chilled Laboratory must use special kit to Prepare specimen for shipment	40 – 130 pg/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
GLUCOSE, SERUM	Oxygen Rate Chemistry	Yellow top tube – 1 ml serum	65 – 99 mg/ dl Impaired fasting glucose: 100 – 125 mg/dl Provisional Diagnosis of Diabetes: >= 126 mg/dl	
GLUCOSE, 2HR. POST PRANDIAL	Oxygen Rate Chemistry	Yellow top tube – 1 ml serum	< 140 mg/dl Impaired Glucose Tolerance: 140 – 199 mg/dl	
GLUCOSE, CSF	Oxygen Rate Chemistry	CSF – 1 ml	40 – 70 mg/dl	
GLUCOSE, URINE	Oxygen Rate Chemistry	random urine – 20 ml		
GLUCOSE, URINE 24 HR.	Oxygen Rate Chemsitry	24 Hr. Urine No preservative	<0.025 g/ 24 Hr.	
GROWTH HORMONE	Immunochemiluminometric (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	< 5ng/ml	Patients should be fasting
HALOPERIDOL	Liquid Chromatography/ Mass spectrometry (LC/ MS) Reference Laboratory	Red top tube – 3 ml serum Centrifuge & separate – send serum	Therapeutic: 4 – 26 ng/ml	
HAPTOGLOBIN	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	16 – 200 mg/dl	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
HCG, QUANTITATIVE	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	Males: <0.5 – 2.67 MIU/ml Females: Non-pregnant <0.5 – 2.90 MIU/ml Borderline: 5 – 50 MIU/ml Suggest redraw after 48 hours Pregnant: >50 MIU/ml	
HEAVY METALS, BLOOD	Atomic Absorption Spectrometry; Inductively-coupled plasma-mass Spectrometry (ICP-MS) Reference Laboratory	Royal Blue EDTA tube – whole blood 7ml whole blood – send tube	See interpretation for individual tests	
HEAVY METALS, URINE	Atomic Absorption Spectrometry; Inductively-coupled plasma-mass Spectrometry (ICP-MS) Reference Laboratory	Urine (random or 24 hr.) 20 ml No preservative	See interpretation for individual tests	
HDL CHOLESTEROL	Timed- Endpoint Chemistry	Yellow top tube – 1 ml	Males: 27 – 67 mg/dl Females: 29 – 89mg/dl < 45 greater than average Risk For CHD > 45 less than average risk for CHD	Patients should be fasting for 14 hours
HEMOGLOBIN A1C	High-Pressure Liquid Chromatography (HPLC) Chemistry	Lavender EDTA tube- whole blood	4.2 – 5.9% <6% non-diabetic 6 – 7 % Near normal glycemia 7% Goal 7 – 8% Good Control 8% Action suggested	
HEMOGLOBIN A2	Immunoassay Reference Laboratory	Lavender EDTA tube – whole blood	4.5% - 5.7%	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
HEMOGLOBIN ELECTROPHORESIS	Electrophoresis Reference Laboratory	Lavender EDTA tube – whole blood	See interpretative report	
HEMOGLOBIN F	High-Pressure Liquid Chromatography (HPLC) Reference Laboratory	Lavender EDTA tube – whole blood	Adults: <2%	
HEPATITIS B DNA QUANT	HBV Hybrid capture; Nucleic Acid Hybridization Reference Laboratory	Yellow top tube – 2 ml serum send **frozen serum**	Negative	
HERPES ANTIBODIES	Enzyme Immunoassay (EIA) Reference Laboratory	Yellow top tube – 1 ml	Negative: <0.9	
HISTAMINE, PLASMA	Radioimmunoassay (RIA) Reference Laboratory	Lavender EDTA tube – 1 ml plasma Centrifuge & separate plasma Send **frozen plasma**		
HISTOPLASMA AB	Double immunodiffusion (DID) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: < 1:1	
HLA B27	Polymerase chain reaction (PCR)/ Sequence-specific primers (SSP) Reference Laboratory	Lavender EDTA tube	Negative	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
HOMOCYSTINE	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 2.2 ml serum Tube should be chilled and kept on Ice once collected	Homocyst(e)ine: Normal: 5 – 15 µmol/L Optimal: <12 µmol/L Hyperhomocyst(e)inemia: Borderline: 12 – 15 µmol/L Moderate: >15-30µmol/L Intermediate: >30-100µmol/L Severe: >100µmol/L Detection limit: 2.5 µmol/L	
HYDROXYPROLINE, FREE	Spectrophotometric Reference Laboratory	24-Hour Urine w 30 ml 6 N HCL send 30 ml aliquot	0 – 4.0 mg/24 hours	State Volume for 24 hrs.
HYDROXYPROLINE, TOTAL	Spectrophotometric Reference Laboratory	24-Hour Urine w 30 ml 6 N HCL send 30 ml aliquot	7 – 43 mg/ 24 hours	State Volume for 24 hrs.
IMIPRAMINE, SERUM	High-Pressure Liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & Separate	Therapeutic: Imipramine + desipramine: 150 – 250 ng/ml	
IMMUNOGLOBULINS-IgG, IgA, IgM	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	IgG: 694 – 1618 mg/dl IgA: 68 – 378 mg/dl IgM: 60 – 263 mg/dl	
INSULIN	Immunochemiluminometric assay (ICMA) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate serum Transfer to a plastic transport tube	Adults: 6 – 27 µIU/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
INTRINSIC FACTOR ANTIBODIES	Radioimmunoassay (RIA) Reference Laboratory	Yellow top tup – 1 ml serum	Negative	
IONIZED CALCIUM	Potentiometric Philadelphia VA	Green top Heparinized tube	1.13 – 1.32 mmol/L	
IRON	Turbidmetric Philadelphia VA	Yellow top tube – 1 ml serum	Male: 45 – 182 mcg/dl Female: 28 – 170 mcg/dl	
KAPPA LAMBDA QUANTS	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	Kappa: 574 – 1276 mg/dl Lamda: 260 – 638 mg/dl	
LACTIC ACID	Chemistry	Gray top tube – collect on ice Centrifuge & separate plasma Send **frozen plasma**	0.3 – 2.5 mmol/L	
LAMICTAL	Liquid Chromatography/ Tandem Mass spectrometry (LC/ MS-MS) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate Maintain at room temperature	Therapeutic Range: Trough: 2.0 – 20.0 µg/ml	
LATEX SPECIFIC IgE	Ultrasensitive Turbo-MP Modified RAST Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate Refrigerate	Negative	
LDH, TOTAL	Enzymatic Rate Chemistry	Yellow top tube – 1 ml serum	91 – 180 IU/L	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
LDH ISOENZYMES	Electrophoresis Reference Laboratory	(2) Red top tubes – 3 ml serum Centrifuge & Separate	See Interpretative Report	
LEAD, BLOOD	Atomic Absorption Spectrometry (AAS) Reference Laboratory	Royal Blue EDTA tube – whole blood send original tube	Negative	
LEGIONELLA ANTIBODY	Enzyme-linked immunosorbent Assay (ELISA) Reference Laboratory	Yellow top tube – 1 ml serum Maintain at room temperature	Negative	
LEPTOSPIRAL ANTIBODIES	Indirect Hemagglutination (IHA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: <1:50 Borderline: 1:50 Positive: > 1:50	
LEUKEMIA/ LYMPHOMA PANEL	Reference Laboratory	Yellow top tube – 2 ml serum	Negative	
LEUKEMIA/ LYMPOMA FLOW CYTOMETRY	Flow Cytometry Reference Laboratory	Lavender EDTA tube – whole blood OR 2 ml heparinized bone marrow aspirate Submit at room temperature using Leukemia/ Lymphoma specimen Transport kit	Negative	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
LEUKOCYTE ALKALINE PHOSPHATASE (LAP) SCORE	Enzymatic Reference Laboratory	Green Heparinized tube – whole blood Send six properly labeled blood smears	25 – 130	
LIDOCAINE	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate	Therapeutic: 1.5 – 5.0 µg/ml	
LIPASE	Colorimetric Chemistry	Yellow top tube – 1 ml serum	7 – 58 IU/L	
LIPID PROFILE (includes HDL, LDL, CHOLESTEROL, TRIG)	See individual tests Chemsitry	Yellow top tube – 2 ml serum	See individual tests	
LIPOPROTEIN PHENOTYPING PROFILE	Electrophoresis with Fredrickson Phenotyping criteria Reference Laboratory	(2) Yellow top tubes – 5 ml serum	Normal pattern; See interpretative Report	
LITHIUM	Colorimetric Chemistry	Red top tube – 1 ml serum Centrifuge & separate	Therapeutic:	
LIVER-KIDNEY MICROSOMAL ANTIBODIES	Enzyme-Linked immunosorbent Assay (ELISA) Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0.0 – 20.0 Equivocal: 20.1 – 24.9 Positive: > 24.9	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
LUTENIZING HORMONE	Chemluminescent Immunoassay Philadelphia VAMC	Yellow top tube – 1 ml serum	Males: 1:24 – 8.62 mIU/ml Females: Mid Follicular: 2.12 – 10.89 mIU/ml Mid-Cycle Peak: 19.18 – 103.13 mIU/ml Mid-Luteal: 1.20 – 12.86 mIU/ml Postmenopausal: 10.87 – 58.64 mIU/ml	
LYSOZYME	Enzymatic Reference Laboratory	Yellow top tube – 1 ml serum	Male: 3 – 12.8 µg/ml Female: 2.5 – 12.9 µg/ ml	
MAGNESIUM	Timed Endpoint Chemistry	Yellow top tube – 1 ml serum	1.8 – 2.5 mg/dl	
MAGNESIUM, 24 HR URINE	Timed Endpoint Philadelphia VA	24 Hr. Urine w 30 ml 6 N HCL	72.9 – 121.5 mg/ 24 hrs.	State Volume for 24 Hrs.
MANGANESE	Inductively-coupled mass Spectrometry (ICP-MS) Reference Laboratory	Royal Blue EDTA tube – whole blood Maintain at room temperature	8.0 – 18.0 µg/ L	
MELANOCYTE STIMULATING HORMONE	Radioimmunoassay (RIA) Reference Laboratory	Lavender EDTA tube – plasma Centrifuge & separate- send **frozen plasma**		
MERCURY	Inductively coupled plasma Mass spectrometry (ICP-MS) Reference Laboratory	Royal blue EDTA tube –whole blood send original tube	Environmental exposure: 0.0 – 8.0 µg/ml Occupational exposure: 15.0 µg/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL
METANEPHRINES, FRACTIONATED, QUANTITATIVE 24-Hour	High-pressure liquid Chromatography (HPLC) w electrochemical (EC) detection	24 hr. urine w 30ml 6 N HCL	Normetanephrine: 82 - 500µg/24hrs. Metanephrine: 45-290 µg/ 24 hrs	State Volume for 24 hrs
METHANOL	Gas Chromatography (GC) Reference Laboratory	Gray-stopper (sodium fluoride/ potassium oxalate whole blood) Send original tube	Negative	
METHOTREXATE	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate Transfer to plastic transfer tube	Potentially toxic: after 24 hours: >5.00 µmol/L after 48 hours: >0.50 µmol/L after 72 hours: >0.05 µmol/L	
METHYLMALONIC ACID, SERUM	Gas Chromatography/ Mass Spectrometry (GC/MS) Reference Laboratory	Yellow top tube – 1 ml serum	73 – 376 nmol/L	
METHYLMALONIC ACID, URINE	Gas Chromatography/ Mass spectrometry (GC/MS) Reference Laboratory	Random Urine, 20 ml	0.4 – 2.5 µmol/ mmol crt Test includes urine creatinine	State Volume for 24 Hrs.
MEXILETINE	High-pressure liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate Transfer to plastic transfer tube	Therapeutic: 0.75 – 2.00 µg/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
MICROALBUMIN, 24 Hr. URINE	Turbidmetric Philadelphia VA	24 Hr. Urine – No preservative	<30 mg/24 hrs.	State Volume for 24 Hrs.
MICROALBUMIN, RANDOM	Turbidmetric Philadelphia VA	Random Urine – 20ml	Microalbumin: 0-1.8 mg/dl Creatinine: None Microalb/ creat: 0 – 29 µg/mg creat	
MYELIN BASIC PROTEIN	Enzyme Linked immunosorbent Assay (ELISA) Reference Laboratory	Cerebrospinal fluid –**Frozen** 1 ml	0.0 – 1.0 ng/ml	
MYOGLOBIN	Immunochemiluminometric Assay (ICMA) Reference Laboratory	Yellow top tube – 1 ml serum	<50.0 ng/ml	
NORTRIPTYLINE	High-Pressure Liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 2 ml serum Centrifuge & separate Transfer to plastic transfer tube	Therapeutic: 50 –150 ng/ ml	Collect trough level; draw immediately prior to next dose
OLIGOCLONAL BANDING	High Resolution Electro-phoresis Reference Laboratory	Cerebrospinal Fluid and serum Yellow top tube –centrifuge & separate-transfer 1 ml serum into Plastic transport tube and **freeze** Transfer 1 ml CSF into plastic Transport tube and **freeze** Submit both specimens **frozen**	NONE	
OSMOLALITY, SERUM	Freezing Point Depression Reference Laboratory	Yellow top tube – 1 ml serum	289 – 305 mOsm/L	

CHEMISTRY

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
OSMOLALITY URINE	Freezing Point Depression Reference Laboratory	Random Urine – 20 ml	300 – 400 mOsm/L	
OSTEOCALCIN	Immunochemiluminometric Assay (IMCA) Reference Laboratory	Yellow top tube – 1 ml serum	see interpretative report	
OXALATE, 24 HR. URINE	**Enzymatic** Reference Laboratory	24 Hr. Urine – 30 ml 6 N HCL submit 100 ml aliquot	Male: 7 – 44 mg/ 24 hrs. Female: 4 – 31 mg/ 24 hrs.	State volume for 24 Hrs**.**
PARATHYROID HORMONE, INTACT	Immunochemilumimetric Assay (IMCA) Philadelphia VA	1 WHITE top plasma separator	12 – 72 pg/ml	
PARATHYROID HORMONE-RELATED PEPTIDE	Radioimmunoassay (RIA) Philadelphia VA	Plasma (with protease inhibitor), **frozen** Centrifuge & separate. Transfer to plastic Transport tube. Send Frozen. Special tubes with protease inhibitor may Be obtained from the laboratory		
PHENOBARBITAL	Turbidimetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & separate	Therapeutic: 15 – 40 µg/ml	
PHOSPHORUS, SERUM	Timed Rate Chemistry	Yellow top tube – 1 ml serum	2.5 – 4.6 mg/dl	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
PHOSPHORUS, 24HR. URINE	Timed Rate Philadelphia VA	24 Hr. Urine w 30 ml 6N HCL	25 – 125 mmol/ 24 Hrs.	State Volume for 24 Hrs.
PORPHYRINS, QUANT, 24 HOUR URINE	High-pressure liquid Chromatography with fluorometric detection Reference Laboratory	24 Hr. Urine, **protected from light**	Coproporphyrins: Males: 10 – 109 µg/24 hr. Females: 3 – 56 µg/24 hr. Hepatocarboxylporphyrins: Males: 0 –12 µg/24 hr. Females: 3 – 9 µg/24 hr. Hexacarboxylporphyrins: Males & Females: 0 – 5 µg/24 hr. Pentcarboxylporphyrins: Males: 0 –4 µg/24hr. Females: 0 – 3 µg/24 hr. Uroporphyrins: Males: 8 – 44 µg/24hr. Females: 4 – 22 µg/ 24 hr.	State Volume for 24 hrs.
POTASSIUM (SERUM)	Potentiometric (Ion Selective Electrode Chemistry	Yellow top tube – 1 ml serum	3.6 – 5.0 mmol/L	
POTASSIUM, 24 HOUR URINE	Potentiometric (Ion Selective Electrode Chemistry	24 Hour Urine – No preservative	25 – 125 mmol/ 24 hrs.	State Volume for 24 hours
POTASSIUM, URINE	Potentiometric (Ion Selective Electrode	Random Urine – 20 ml	None	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
PREALBUMIN	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	18 – 45 mg/dl	
PROGESTERONE	Immunochemiluminometric Assay (IMCA) Reference Laboratory	Yellow top tube – 1 ml serum	Males: <0.3 – 1.2 ng/ml See interpretative report for ranges for females	
PROINSULIN	Enzyme immunoassay (EIA) Reference Laboratory	Yellow top tube – 1 ml serum	0.0 – 9.4 pmol/L	
PROLACTIN	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	Males: 2.64 – 13.13 ng/ml Females: <50 yrs.: 3.34 – 26.72 ng/ml >50 yrs.: 2.74 – 19.64 ng/ml	
PROSTATIC ACID PHOSPHATASE (PAP)	Microparticle Enzyme Immunoassay (MEIA) Reference Laboratory	Yellow top tube – 1 ml serum	0 – 2.7 ng/ml	
PROTEIN ELECTROPHORESIS, CSF	Electrophoresis Philadelphia VA	5 ml CSF and 1 yellow top tube 1 ml serum	See interpretative Report	
PROTEIN ELECTROPHORESIS, SERUM	Electrophoresis Philadelphia VA	Yellow top tube – 1 ml serum	Albumin: 3.53 – 5.83 Alpha 1: 0.11 – 0.32 Alpha 2: 0.22 – 1.10 Beta: 0.53 – 1.14 Gamma: 0.50 – 1.54	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
PROTEIN ELECTROPHORESIS, URINE	Electrophoresis Philadelphia VA	Random Urine or 50 ml urine from 24 Hr. Urine – no preservative	See interpretative Report	
PROTOPORPHYRIN	Fluorometry Reference Laboratory	Lavender EDTA tube- whole blood	Environmental exposure: 0 – 34 µg/dl	
PSA (TOTAL & Free)	Chemiluminescent Chemistry	Yellow top tube – 1 ml serum	0 – 4 ng/ml	
QUINIDINE	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge & separate	Therapeutic: 2.0 – 5.0 µg/ml	
RAST- ALLERGENS ZONE 3	Reference Laboratory	Yellow top tube – 3 ml serum	Tests for Miscellaneous trees & grasses See report for Allergy detection	
RAST –ANIMAL	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	
RAST – DUST	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	
RAST – GRASS	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	
RAST – MOLD	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
RAST – NORTHERN COAST TO COAST	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	
RAST – REGIONAL PANEL 1	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	
RAST – TREE	Reference Laboratory	Yellow top tube – 3 ml serum	See Report	
RENIN	Radioimmunoassay (RIA) Reference Laboratory	Lavender EDTA tube – plasma Centrifuge & separate Send **frozen plasma**	Upright: 1.31 – 3.95 ng/ml/h Supine: 0.15 – 2.33 ng/ml/h	
REVERSE T3	Radioimmunoassay (RIA) Reference Laboratory	Yellow top tube – 1 ml serum	>15 yrs.: 90 – 350 pg/ml	
RHEUMATOID FACTOR (RF)	Nephelometry Philadelphia VA	Yellow top tube – 1 ml serum	< 20 IU/ml	
SALICYLATE	Immunoassay Reference Laboratory	Red top tube – 1 ml serum Centrifuge & Separate	Therapeutic (anti-inflammatory) 30 – 250 µg/ml	
SEROTONIN	High-pressure liquid Chromatography (HPLC) Reference Laboratory	Red top tube – 2 ml serum Centrifuge & separate	Male: 21 – 321 ng/ml Female: 0 – 4210 ng/ ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
SILVER, PLASMA	Inductively-coupled plasma-Mass spectroscopy (ICP-MS) Reference Laboratory	Royal Blue EDTA tube Centrifuge & separate plasma Maintain at room temperature	Environmental Exposure: < 5.0 µg/L Occupational Exposure: 1.0- 26.0 µg/L	
SILVER, URINE	Inductively-coupled plasma-Mass spectroscopy (ICP-MS) Reference Laboratory	Plastic Urine Container – no Random or 24 hr. (5ml)	Environmental Exposure: 0.0 – 0.9 µg/L 0.0 – 0.9 µf/ 24Hr. Silver-creatinine ratio: 0.0 – 0.9 µg/g creatinine	State volume for 24 Hr. Urine
SJOGREN ANTIBODIES	Flow Cytometry Reference Laboratory	Yellow top tube – 1 ml serum	Negative: 0 –99 units/ml	
SODIUM	Potentiometric (Ion Selective Electrode) Chemistry	Yellow top tube – 1 ml serum	135 – 145 mmol/L	
SODIUM, 24 HOUR URINE	Potentiometric (Ion Selective Electrode) Chemistry	24 Hr. Urine – No Preservative	40- 220 mmol/ 24 Hr.	State Volume for 24 Hr.
SODIUM, URINE	Potentiometric (Ion Selective Electrode) Chemistry	Random Urine – 20 ml	None	
SOLUBLE TRANSFERRIN	Enzyme-linked immunosorbent Assay (ELISA) Reference Laboratory	Red top tube – 1 ml serum	8.7 – 28.1 nmol/L	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
T3 UPTAKE	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	32.0 – 48.4%	
T4, TOTAL	Chemiluminescent Immunoassay	Yellow top tube – 1 ml serum	6.09 – 12.23 µg/dl	
T7 (T4, T3RU, FTI)	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	T3RU: 32.0 – 48.4% T4: 6.09 – 12.23 µg/dl FTI: 5.93 – 13.13 µg/dl	
TACROLIMUS (FK506)	Microparticle Enzyme Immunoassay (MEIA) Reference Laboratory	Lavender EDTA tube – whole blood	Therapeutic: Trough: Immediately following Transplant: 15.0 ng/ml Trough: Steady State: >= 2 weeks post transplant: 3.0 – 8.0 ng/ml	
TESTOSTERONE	Immunochemiluminometric Philadelphia VA	Yellow top tube – 1 ml serum	Male: 280 – 800 ng/dl Female: 6 – 82 ng/dl	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
TESTOSTERONE, FREE (DIRECT)	Radioimmunoassay (RIA) Reference Laboratory	Yellow top tube – 2 ml serum	Male: 20 – 29 yrs: 9.3 – 26.5 pg/ml 30 – 39 yrs: 8.7 – 25.1 pg/ml 40 –49 yrs: 6.8 – 21.5 pg/ml 50 –59 yrs. 7.2 – 24.0 pg/ml > 60 yrs: 6.6 – 18.1 pg/ml Female: 20 – 59 yrs: 0.0 – 2.2 pg/ml >60 yrs: 0.0 – 1.8 pg/ml	
THEOPHYLLINE	Turbitmetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & Separate	Therapeutic: 10 – 20 µg/ml	Peak levels should be drawn 2 – 5 hours after Oral dose. Trough levels are drawn Just prior to next dose
THIOTHIXENE	Fluorometry Reference Laboratory	Red top tube – 3 ml serum Centrifuge & Separate	Therapeutic: 10 – 100 ng/ml	
THYROGLOBULIN	Chemiluminescent enzyme Immunometric Reference Laboratory	Yellow top tube – 3 ml serum	0 – 55 ng/ml	
THYROXINE-BINDING	Immunochemiluminometric Assay Reference Laboratory	Yellow top tube – 1 ml serum	> 18 yrs: 13 – 39 mcg/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
TOBRAMYCIN	Turbidmetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & Separate	Therapeutic Range: Peak: 5 – 8 µg/ml Trough: <2 µg/ml	Peak levels should be drawn 1 hour after IM dose and 30 min after IV dose. Trough levels Should be drawn just Prior to the next dose
TOTAL T3	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	0.87 – 1.78 ng/ml	
TRANSFERRIN	Turbidimetric Philadelphia VA	Yellow top tube – 1 ml serum	Males: 180 – 329 mg/dl Females: 192 – 282 mg/dl	
TRIGLYCERIDE	Timed Endpoint Chemistry	Yellow top tube – 1 ml serum	35 – 160 mg/dl	
TROPONIN – I	Chemiluminescence	Mint Green – 1 ml plasma	< 0.04 ng/ml	Critical Value ≥ 0.04 0.04-0.5 ng/ml: possible Cardiac damage. >0.5ng/ml suggests MI
TSH	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum	0.34 – 5.60 mcIU/ml	
UREA NITROGEN, SERUM	Enzymatic Conductivity Chemistry	Yellow top tube – 1 ml serum	6 – 22 mg/dl	
UREA NITROGEN, 24 HOUR URINE	Enzymatic Conductivity Philadelphia VA	24 Hour Urine – no preservative	12 – 20 g/24 hr.	State Volume for 24 Hour

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
URIC ACID, SERUM	Colorimetric Chemistry	Yellow top tube – 1 ml serum	2.6 – 7.2 mg/dl	
URIC ACID, 24 HR. URINE	Colorimetric Philadelphia VA	24 Hr. Urine – No preservative	250 – 750 mg/24 hr.	
URINALYSIS	Automated Dipstick Reader Automated Microscopic Reader Urinalysis	15 ml random urine. No preservative	Dipstick: Color: Yellow Turbidity: Clear Specific Gravity: 1.002 – 1.030 PH: 5.0 – 6.0 Protein: Negative Glucose: Negative Ketones: Negative Leukocyte Esterase: Negative Nitrites: Negative Microscopic: WBC: <5/HPF RBC: <5/HPF Epithelial Cells: Occasional Bacteria: None Mucus: Occasional Crystals: None Casts: Occ. Hyaline	
URINE PORPHOBILINOGEN	Ion-exchange chromatography spectrophotometry Reference Laboratory	24 Hr urine – protect from light	0.0 – 1.5 mg/ 24 Hr.	State Volume for 24 Hr.
VALPROIC ACID	Turbidmetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & Separate	Therapeutic: 50 – 100 mcg/ ml	Level should be a trough-drawn just prior to next Dose; for peak, draw 1 – 3 hours after dose

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
VANCOMYCIN	Turbidmetric Inhibition Chemistry	Red top tube – 1 ml serum Centrifuge & separate	Therapeutic: Peak: 30 – 40 mcg/ml Trough: 5.0 – 10.0 mcg/ml	Peak levels are drawn 1 hr after IM dose and 30 min after IV dose; Trough is drawn just prior to next dose
VISCOSITY	Viscosimetry Reference Laboratory	(2) Yellow top tubes – 5 ml serum	1.6 – 1.9 relative to saline	
VITAMIN B-1	High-pressure liquid Chromatography (HPLC) With fluorescence detection Reference Laboratory	Lavender EDTA tube – whole blood Protect from Light	25.0 – 75.0 µ/l	
VITAMIN B12	Chemiluminescent Immunoassay Philadelphia VA	Yellow top tube – 1 ml serum Serum should not be hemolyzed	180 – 914 pg/ml	
VITAMIN B6	High-pressure liquid Chromatography (HPLC) With electrochemical Detection Reference Laboratory	Lavender EDTA tube – whole blood Protect from Light	3.0 – 18.0 ng/ml	

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
VITAMIN C	High-Pressure Liquid Chromatography (HPLC) With electrochemical Detection Reference Laboratory	Yellow top tube – 2 ml serum Protect from light	0.4 – 2.0 mg/dl	
VITAMIN D	Immunochemiluminometric Philadelphia VAMC	Yellow top tube – 1 ml serum	32 – 100 ng/ml	
VITAMIN D, 1, 25 DIHYDROXY	Column Chromatography; Radioimmunoassay (RIA) Reference Laboratory	Yellow top tube – 3 ml serum Protect from Light		
VITAMIN E	High-Pressure Liquid Chromatography (HPLC) With fluorescence Detection Reference Laboratory	Yellow top tube – 2 ml serum Protect from light	Alpha: 3.0 – 15.8 mg/l Beta plus gamma: < 5.0 mg/l	
VITAMIN K1	HPLC with Electrochemical Detection Reference Laboratory	Lavendar top tube. Draw in chilled tube; spin and separate plasma From cells. Freeze. Protect from Light.	0.28 – 1.78 ng/ml	
VMA, 24 HR. URINE	High-pressure liquid Chromatography (HPLC) With electrochemical Detection Reference Laboratory	24 Hr. Urine – 30 ml 6N HCL	0.0 – 7.5 mg/24 hrs.	State Volume for 24 hrs.

TEST	METHOD TESTING SITE	SPECIMEN	REFERENCE RANGE	SPECIAL INSTRUCTIONS
ZINC	Atomic Absorption Spectrometry; inductively Coupled plasma-mass Spectrometry (ICP-MS) Reference Laboratory	Yellow top tube – 2 ml serum	Environment Exposure: 70 – 150 µg/dl	

BLOOD BANK

COLLECTION OF BLOOD BANK SPECIMENS

Specimens for Blood Bank include the following:
Type and Screen
Type and Crossmatch
Direct Coombs

It is critical when collecting specimens for Blood Bank that the following process be used:

1. All orders must be accompanied by the proper Blood Bank slip, an SF 518

2. Prior to drawing any specimen, the following must be done:

    A. Ask the patient to identify himself/ herself. Ask the patient for his/ her Full name and full Social Security Number.

    B. Check the patient's wristband for proper identification. Confirm the name And Social Security Number of the patient with the Blood Bank Request (SF 518)

    C. It is necessary to obtain a second verifier. That is an additional lab employee Or an employee from nursing personnel must verifier the identification of the Patient.

3. The SF 518 must have the following information:

    A. The Patient's Full Name

    B. The Patient's Full Social Security Number

    C. The patient's location

D. Date and Time required

E. Product requested

F. Physician Name

G. Diagnosis

H. Informed Consent

4. The SF-518 Must be signed by the person drawing the blood sample and the date and time of collection.

5. The SF-518 must be initialed by the second verifier.

6. The Specimen Requirements are as follows:

A. Specimen Required: 1 (10ml) plain red top tube and 1 (5ml) Lavender EDTA tube is required

B. Labeling the tubes: The following information is required to be on each tube

1. The patient's Full Name

2. The patient's Full Social Security Number

3. Date and Time of Collection

4. Initials of the person drawing the specimen

5. Initials of the second verifier

BLOOD BANK

POLICIES AND PROCEDURES

HOURS OF SERVICE: The Blood Bank is open 24 hours a day, seven days a week to meet all emergency needs. Regular hours when full staff is resent are 8:00 A.M. to 4:30 P.M., Monday through Friday.

ORDERING BLOOD PRODUCTS: Submit one completed form (SF-518) for each Type and Screen and for each unit of blood, platelets, albumin or plasma requested.

PATIENT SPECIMENS: Meticulous care must be devoted to the correct and complete identification of patient specimens for typing, screening, and/ or cross-matching. The patient or someone knowing him/ her should make positive identification when the specimen is drawn, including checking the wristband for name and Social Security Number and asking the patient for his name. A label adherent to the specimen tube **MUST** show the patient's full name, full social security number, hospital location, date of collection, and signature of the person drawing the blood. Submit 10 ml of clotted blood (1red top tube and 1 EDTA lavender top tube) for the initial Blood Bank workup. Person drawing specimen **MUST** also sign in the appropriate place on SF-518.

TYPE AND SCREEN/ TYPE AND CROSSMATCH:

1. A request for a Type and Screen indicates only that the blood type, Rh Factor, screening for atypical antibodies and an auto control will be performed. Patient's specimen will be kept for 72 hours. During that time period the "type and screen" can be converted to a "type and crossmatch". If no problems were detected, i.e. patient had an atypical antibody, blood will be available for transfusion within **15 minutes**.

2. A crossmatch is the procedure of "matching" a unit of blood with the blood of a patient to be sure that they are compatible. This must be done on each unit of blood that is given to a patient. The procedure takes approximately one hour to perform.

3. Crossmatched blood units will be held for a period of **72 hours** only. After that time has elapsed, the unit of blood will be released to be used for another patient.

4. The person picking up the blood product must present the technologist with positive identification of the patient before the product can be signed out of the Blood Bank. A 3x5 card that is stamped with the patient's name, full social security and initials of the person requesting pick-up of the blood product is acceptable. The product is recorded in the Blood Release Log Book and initialed by the technologist and the person picking up the unit (s).

5. Blood is to be stored in the Laboratory Blood Bank and temporarily in the O.R. refrigerator only. If the transfusion is not to be administered immediately**, return the blood** to the laboratory. Blood units returned later than 30 minutes after being signed out of the Blood Bank will be discarded. This also applies to fresh-frozen plasma.

6. Fresh Frozen Plasma (FFP) is only to be issued one unit at a time. The only exceptions are as follows:

   A. If the patient is in Surgery and it is necessary, 2 units can be started Simultaneously.

   B. Up to 4 units can be thawed if ordered by an Attending Physician.

   Otherwise, Blood Bank (Extension 7240) should be notified when half of the first Unit is transfused, so that the next unit can be thawed. It takes approximately 10 Minutes to thaw one unit.

7. Platelets are issued as a pool which contains 8 individual single donor units. The pooled unit must be infused within 4 hours after pooling.

8. In general, if not preempted by other emergency requests, blood and blood products will be available for use as outlined below, provided that the following are received by the Blood Bank:

   A. 10 ml of clotted blood (1 plain red top tube)
   B. 1 EDTA tube (5 ml Lavender top tube)
   C. All tubes must be properly identified and initialed by the person drawing the blood specimens
   D. SF-518 must be properly completed and signed and the requested blood or blood products are available in the laboratory.

E. Turnaround Time:
   1. Fresh Frozen Plasma – **within 1 hour**
   2. Packed Red Blood Cells – **within 2 hours**
   3. Type & Screen converted to Type & Crossmatch - **within 15 minutes**.
   4. Platelets and Cryoprecipitate – **within 1 ½ hours** if available from the American Red Cross Bank.

9. If there is any anticipated delay, the ordering physician will be notified ASAP.

BLOOD BANK

INFUSION OF BLOOD PRODUCTS

AN IV LINE MUST BE STARTED BEFORE PICKING UP BLOOD

1. Do not add any medications or other substances to blood products, except for sterile physiologic saline at the time of infusion, if needed to facilitate the flow of packed cells.

2. Do not infuse blood products through lines containing any solution other than physiologic saline. 5% dextrose in water (D5W) may cause red cell agglutination or lysis; Ringer's lactate may clot citrated blood or plasma.

3. Administer all blood products, including plasma, through a blood filter to remove aggregates and clots. Obtain special filters for platelets and FFP from the Blood Bank. Use a microaggregate filter for white-cell-poor red cells, which can also be obtained from the Blood Bank. This filter is unnecessary if using leukodepleted blood unit.

4. Only a physician or a Registered Nurse may begin the transfusion after he/ she has verified the identity of the patient and the blood product, and has checked the ABO, Rh, and compatibility test findings on the attached form SF-518. A second physician or nurse must confirm, and both must sign the SF-518 at this time.

5. Temperature and Blood Pressure should be taken and recorded prior to the beginning of transfusion. The patient must be closely observed for 15 minutes after beginning the transfusion and every 30 minutes, thereafter, until two hours after completion. If signs or symptoms of reaction develop, stop transfusion but keep the line open with a slow saline drip (see section on Transfusion Reactions).

6. Upon completion or discontinuation of a transfusion, sign and complete the Form SF-518. Place the used blood bag in a plastic ziplock bag and place the completed SF-518 in the pocket of the plastic bag and return to Blood Bank.

7. Blood warmers are available on the wards. Nursing Service has written procedures for the Quality control (Q.C.) and use of the devices. A record of Q.C. is kept with each device. It is the responsibility of the using service to guarantee maintenance and quality assurance of the blood warming devices

BLOOD BANK

INFUSION OF BLOOD PRODUCTS

EMERGENCIES

If extraordinary circumstances appear to require use of :
ABO non-identical blood,
ABO identical but uncrossmatched blood,
Rho-positive blood in Rho-negative patients,
Crossmatch – incompatible blood or
Other irregular practices,

Immediately contact the Blood Bank (Extension 7240) or Chief, Laboratory Service (Extension 7531).
In most instances, preferable alternatives are available.
The responsible clinician must sign a **Release Form** if he/she Chooses to proceed. The Transfusion Committee will Review all such cases.

BLOOD BANK
BLOOD PRODUCTS FACTS AND FIGURES

VOLUME	SHELF LIFE	INDICATIONS FOR USE	REMARKS	RATE OF INFUSION
Packed Red Cells 250-300 ml	35 Days CPDA-1 42 Days AS-1 ADSOL	Symptomatic Anemic	Product of choice for increasing oxygen delivery	< 4 Hours
Leukodepleted Red Cells	42 Days	Repeated Febrile reactions (not related to red cells)	Microaggregate filter not required	< 4 Hours
White-Cell-Poor Red Cells	35 Days CPDA-1 42 Days AS-1-ADSOL	Repeated febrile reactions (not related to red cells)	Must be infused through Microaggregate filter	< 4 Hours
Frozen Washed Red Cells 200 ml	24 Hours	1. Rare Blood 2. Inventory problem	Do not order unless use is certain; approval Pathology required	< 4 Hours
Washed Red Cells 200 – 250 ml	24 Hours	1. Antibodies to plasma proteins 2. PNH	Do not order unless use is certain; approval by Pathology required	< 4 Hours
Platelet Concentrate Single Donor	5 Days	Thrombocytopenia Thrombocytopathy		< 4 Hours
Platelet Concentrate Pooled	4 Hours	Thrombocytopenia Thrombocytopathy		< 4 Hours
Fresh Frozen Plasma 200 – 250 ml	24 Hours once thawed	Replacement of clotting factors	Forms SF-518 must be received before thawing	< 4 Hours
Cryoprecipitate 10 ml/ unit	6 Hours	Replacement of Factor VIII; Uremic thrombocytopathy		< 4 Hours
Albumin (25%) 50 ml	2 years from date prepared	Severe hypoproteinemia		As rapid as patient will tolerate

BLOOD BANK

TRANSFUSION REACTIONS

1. Any suspected untoward effect of transfusion, whether acute hemolysis, delayed hemolysis, fever, pulmonary distress, urticaria, etc., must be reported to the Blood Bank as soon as possible. Urticartia will not be investigated as a possible transfusion reaction unless the physician discontinues the transfusion.

2. In all cases of immediate suspected transfusion reactions, the unit of blood must be stopped, the IV line kept open with the 0.9% saline and the responsible physician and Transfusion Service notified.

    A. The Blood Bank Technologist will take form SF-507 to the ward for completion by the nursing staff.

    B. The technologist will properly identify the patient and record the information on the worksheet. Next, the technologist will collect one 5 ml. Lavender top tube and one 10 ml. Plain red top tube recording patient's full name and Social Security number on all tubes.

    C. The remaining blood, infusion set and SF-518 will be brought back to the Laboratory.

    D. The ward will be instructed to send all post-reaction urines – as voided – to the laboratory for a 24 hour period. If the patient has a catheter, urine should be sent to the Laboratory every 2 – 3 hours during the 24 hour post-reaction period or per responsible physician's instructions. Nursing staff will immediately initiate an intake/ output record and continue recording for the next 24 hours.

3. Protocol for treatment of acute hemolytic reactions should be available at every nursing station.

4. Blood Bank technical and medical staff will study the reported reaction and in the case of a Major Transfusion Reaction report their findings to the responsible physician and pathologist immediately. For Minor Transfusion Reactions the work-up will be performed after all the Microbiology and Urinalysis reports are completed and the pathologist reviews the work-up and will make recommendations concerning future transfusions. These findings will then be forwarded to the patients chart.

5. Positive HIV and suspected transfusion-associated viral hepatitis must be reported to the Infection Control Nurse for follow-up of the donors involved.

BLOOD BANK
ORDERING BLOOD FOR SURGERY

1. All requests and specimens for elective surgery must be in the Blood Bank by 1:00 P.M. the prior day, or 1:00 P.M. Friday for Monday operations.

2. Platelets will be obtained and held in the Blood Bank only for those patients that Medical staff approve.

3. Blood Cross-matched for surgical procedures will be held a maximum of 48 hours postoperative.

4. **Autologous Blood:** This procedure requires the consent of the donor-patient's physician and the Blood Bank physician. The unit must be labeled "For Autologous Use Only", segregated and used solely for this purpose.

   BLOOD IS DRAWN BY TE AMERICAN RED CROSS:

   A. The procedure must be initiated by the patient's physician.

   B. The requesting physician must complete a Request for Blood to be collected for Autologous Transfusion form. Obtain form from Blood Bank.

   C. The completed request form will be sent by Blood Bank for approval by the blood center's Medical Director.

   D. An autologous donation must be medically safe for the patient.

   E. The patient's blood iron level must meet minimum Red Cross Standards for autologous donations.

   F. Autologous donor appointments must be arranged. The Director of Blood Service Nursing will contact the donor and set up the date (s) and location for the donation (s).

   G. Only one unit of blood may be drawn at one visit.

   H. One unit of blood may be drawn every five to seven days provided the patient's blood iron level remains acceptable.

I. Iron supplements should be prescribed by the patient's own physician.

J. Blood is labeled and special tag attached with pertinent information completed with donor's signature appearing on tag.

ANATOMIC PATHOLOGY

Anatomic Pathology includes the following areas: Surgical Pathology, Autopsy and Cytopathology

AUTOPSY

AUTOPSY

REQUEST FORM: Authorization for Autopsy, **Standard Form 523**. The Blank line for **Any Restrictions** must be filled in (e.g. No head). The completed form should be taken to the Details Clerk. The Details Clerk will notify the Laboratory.

AVAILABILITY: Autopsies are available 7 days per week including weekends and holidays. They may be performed during the day or Evening hours.

TURNAROUND TIME: A provisional diagnosis will be provided within 1 working day from the time the Autopsy was completed. The final report will be completed within 30 working days from the time the Autopsy was complete.

SPECIAL INSTRUCTIONS: An autopsy will NOT be performed without the original signed autopsy authorization form. A valid authorization must contain the signature of the highest ranking survivor in the next of kin lineage as follows: spouse, adult children, parents, adult brothers and sisters, relatives, anyone who accepts responsibility for the body for the purposes of burial.
It is the responsibility of one of the patient's physicians to obtain permission for the autopsy from the next-of-kin. Except for Medical Examiner's cases, the patient's physician must sign the death certificate and the pathologist doing the autopsy will fill in the cause of death.

ANATOMIC PATHOLOGY

CYTOLOGY

REQUEST FORMS: All specimens MUST be submitted with a Standard Form 515 that has been completely filled out with the following information:

Patient's Full Name
Patient's Full Social Security Number
Patient's Age/ Date of Birth
Patient's Gender
Patient's Location
Source of Specimen
Brief Clinical History
Name of the Practitioner

SPECIMEN CONTAINERS: All specimen containers MUST be labeled properly with the following information:

(A) Patient's Full Name
Patient's Full Social Security Number
It is also recommended that the source of the specimen be on the specimen container

(B) The Label Must be affixed to the specimen container and not the lid

Specimens should be promptly delivered to the Histology Laboratory. If specimens are to be delayed, then the proper fixative must be used. Refer to the specimen collection portion of this section for fixative instructions.

ANATOMIC PATHOLOGY

CYTOLOGY

SPECIMENS

BODY FLUIDS CYTOLOGY

REQUEST FORM: A standard Form 515, Tissue Examination, correctly and completely filled out must accompany all Specimens. Request Forms Must be time stamped upon receipt in the laboratory.

SPECIMEN: Fresh body fluid obtained by the clinician. This test applies to Pleural Fluid, Thoracentesis Fluid, Peritoneal Fluid, & Pericardiocentesis Fluid Cytology, Synovial Fluid Cytology

COLLECTION CONTAINER: Urine Specimen Container

VOLUME: 50 ml of body fluid

FIXATIVE: Cytolyt Fixative

SPECIAL INSTRUCTIONS: Deliver specimen immediately to Histopathology Laboratory room N3 -95. If culture is needed, the specimen should first be delivered to Microbiology. If specimen is to be delayed, add equal amounts of Cytolyt fixative to the specimen (1:1). If specimen is delivered after hours to the laboratory without fixative, technologist on duty will add the fixative.

TURNAROUND TIME: 24 – 48 Hours

BRONCHIAL WASHINGS, CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all Specimens. Request Forms Must be time stamped upon receipt in the laboratory.

SPECIMEN: The specimen is collected by the clinician. The specimen should be collected fresh.

COLLECTION CONTAINER: Conical –shaped specimen container

FIXATIVE: Cytolyt Fixative

SPECIAL INSTRUCTIONS: Specimen will be freshly collected. Add approximately 30 cc. of Cytolyt Fixative to the specimen container, screw on the cap tightly and shake vigorously for 30 seconds.

TURNAROUND TIME: 24 – 48 Hours

ANATOMIC PATHOLOGY

CYTOLOGY

SPECIMENS

BRUSHINGS, CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: Brush from lesion area. This test applies to Bronchial Brushings, Esophageal Brushings, Gastric Brushings, Small Bowel Brushings, Colonic Brushings, Tracheal Brushings, & Oropharyngeal Brushings.

COLLECTION CONTAINER: Coplin Jar/ specimen cup

FIXATIVE: 95% Isopropyl Alcohol/ Spray fixative

SPECIAL INSTRUCTIONS: Specify the site brushed on specimen container and on Standard Form 515

COLLECTION: Roll brush over glass slide to cover the are of a dime and fix IMMEDIATELY in 95% isopropyl alcohol or using Spray Fixative. Label both the specimen container and the slide. The frosted slide should contain at least the patient's name and Social Social Security Number.

TURNAROUND TIME: 24 – 48 Hours

CEREBROSPINAL FLUID, CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all Specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: Cerebrospinal Fluid (CSF)

COLLECTION CONTAINER: Original Collection Tube.

FIXATIVE: NONE

TURNAROUND TIME: 24 – 48 Hours

ANATOMIC PATHOLOGY

CYTOLOGY

SPECIMENS

CERVICAL/ VAGINAL, CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: Cervical aspiration and cervical scrape are recommended.

COLLECTION CONTAINER: Surepath/ Tripath Vials are available from the laboratory. If slides are to be made and sent, They must be IMMEDIATELY fixed with Cyto –Prep Spray fixative. All slides must be labeled with patients name and social Security number.

FIXATIVE: For slides, all slides must be IMMEDIATELY fixed with Cyto-Prep Spray Fixative.

TURNAROUND TIME: Up to 16 days

GASTRIC WASHINGS, CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

PATIENT PREPARATION: Patient must be fasting at least 12 hours prior to procedure.

SPECIMEN: Gastric Washings

COLLECTION: Collect resting gastric contents and submit. Then instill 300 m to 500 ml of normal saline through the gastric tube. Have patient then sit, lie on back, lie on stomach, lie on right side, lie on left side. Then aspirate as much of injected saline as possible And place in container packed in ice.

COLLECTION CONTAINER: Clean sealed plastic container packed in ice.

FIXATIVE: None

TURNAROUND TIME: 24 – 48 Hours

ANATOMIC PATHOLOGY

CYTOLOGY

SPECIMENS

NEEDLE ASPIRATION, CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: Needle aspirate. This test applies to Breast Needle Aspiration, Lung Needle Aspiration, Thyroid Needle Aspiration, Bone Needle Aspiration, Pancreas Needle Aspiration, Synovium Needle Aspiration, Fine Needle Aspiration, Lymph Node Aspiration, Liver Needle Aspiration, Joint Needle Aspiration, Brain Needle Aspiration

COLLECTION CONTAINER: Coplin Jar/ Specimen Cup. Properly fixed Smears may also be submitted.

FIXATIVE: 95% Isopropyl Alcohol, 50% Isopropyl Alcohol, Spray Fixative for Air dried smears

SPECIAL INSTRUCTIONS: After the smears are prepared, some must be air-dried and others must immediately be either spray Fixed or immersed in a container filled with 95% Isopropyl Alcohol. Residual material remaining in the needle after each pass may be expressed into a container filled with 50% Isopropyl Alcohol. If a fluid specimen is obtained (e.g. cyst fluid), the contents of the syringe should be emptied into a container with 50% Isopropyl Alcohol.

TURNAROUND TIME: 24 – 48 Hours

SPUTUM CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: Expectorated Sputum, not saliva or nasal aspirates

VOLUME: Not less than 3 ml of sputum

COLLECTION CONTAINER: Plastic specimen container with a screw-on lid and half-filled with “Cytolyt Fixative”

FIXATIVE: Cytolyt Fixative

TURNAROUND TIME: 24 – 48 Hours

CYTOLOGY

SPECIMENS

URINE CYTOLOGY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: First morning specimen, voided or catheterized. Also acceptable is intraoperative washings of urinary bladder, ureters, and renal pelvis.

VOLUME: at least a 50 ml specimen is required

COLLECTION CONTAINER: Plastic specimen container

FIXATIVE: Specimen should be delivered promptly to laboratory. Once delivered, the specimen is fixed with Cytolyt Fixative.

TURNAROUND TIME: 24 – 48 Hours

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

REQUEST FORMS: All specimens MUST be submitted with a Standard Form 515 that has been completely filled out with the following information:

Patient's Full Name
Patient's Full Social Security Number
Patient's Age/ Date of Birth
Patient's Gender
Patient's Location
Source of Specimen
Brief Clinical History
Name of the Practitioner

SPECIMEN CONTAINERS: All specimens containers should be received as follows:

(A) Specimen Labels should contain the following:
Patient's Full Name
Patient's Full Social Security Number
It is also recommended that the source of the specimen be on the specimen container

(B) Specimen Labels Must be affixed to the specimen container and not the lid

(C) Specimens are to be fixed with 10% buffered formalin and submitted in plastic containers with lids. The volume formalin must be at Least 10 times the volume of tissue, in a large enough container.

(D) If more than one specimen is to be received for one patient, the containers must be labeled "A" or "B" to correspond with the Respective information supplied on the tissue examination form.

(E) Specimens should be promptly delivered to the Histology Laboratory. All formalin-fixed specimens from the operating rooms (OR) will Be picked up from a designated are in OR by lab personnel

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

The following is a list of specimens that should be submitted fresh (NO FORMALIN):

1. Lymph Nodes
2. Breast Tumors
3. Mastectomies
4. Spleens
5. Nerve Biopsies
6. Muscle Biopsies
7. Kidney Biopsies
8. Uteri for Endometrial Cancer
9. Colectomies for Cancer
10. Lung for Cancer
11. Total Prostatectomies
12. Large Amputated Specimens
13. Specimens requiring culture or an immediate Pathology Consultation with or without Frozen Section

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

SURGEICAL PATHOLOGY SPECIMENS REQUIRING ONLY GROSS EXAMINATION

The following types of specimens may, at the discretion of the Pathologist, be examined grossly without preparation of microscopic sections, **unless** sections are specifically requested by the clinician submitting the specimen.

1. Toenails and fingernails
2. Varicose veins
3. Tissue attached to foreign objects
4. Tissue from recent traumatic injuries, including amputated extremities.
5. Adipose tissue and skin from panniculectomey
6. Orchiectomy specimens for prostatic carcinoma
7. Ribs removed for exposure, except in cases of suspected malignancy
8. Aortic aneurysm contents
9. Artherosclerotic carotid plaques
   (Note: Coronary arteriosclerotic plaques should have microscopic exam with specific mention of presence of intima or media)
10. Skin and adipose tissue from plastic surgery procedures
11. Nasal cartilage and bone from plastic surgery procedures
12. Meniscus (torn)
13. Bone fragments from orthopedic procedures to correct deformities (exostosis, bunions, etc.)
14. Caculi (stones)
15. Lumbar bone and tissue from routine disk surgery
16. Clavicle or acromion from rotator cuff repair
17. Aortic plugs, atrial appendage or saphenous veins from bypass surgery
18. Silicone breast implants
19. Thymus from congenital heart surgery

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

BIOPSY SPECIMENS
TISSUE SPECIMENS

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: This test is for Lung Biopsy, Liver Biopsy, Kidney Biopsy, Rectal Biopsy, Small Bowel Biopsy, Skin Biopsy, Bronchial Biopsy, and All removed tissue. Fresh tissue or tissue fixed in phosphate buffered formalin. Submit entire amount of tissue removed surgically.

TEST INCLUDES: Gross examination only, or gross and microscopic examination and/ or diagnosis of all surgically Removed tissue

CONTAINER: Plastic containers of varying sizes. Fresh small specimens should be submitted on a sterile pad moistened With saline.

FIXATIVE: Specimens are to be fixed with 10% buffered formalin and submitted in plastic containers with lids. The volume formalin must be at least 10 times the volume of tissue, in a large enough container**.**

COLLECTION: Specimens are to be fixed with 10% buffered formalin and submitted in plastic containers with lids. The volume formalin must be at least 10 times the volume of tissue, in a large enough container.

TURNAROUND TIME: 24 – 48 Hours

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

FROZEN TISSUE SECTION

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

REQUESTS: Please give a complete history and the source of specimen as well as the anticipated time the specimen will be taken. If the request is cancelled, the lab should be notified immediately.

AVAILABILITY: Monday – Friday, 8:00AM – 4:30 PM. Other times "on call". After 4:30PM and on weekends the pathologist should be given at least 30 minutes lead time if a frozen section consult is required. Frozen Section requests should be made on at least the work day preceding the operation on Tissue Request Forms, by a note on the schedule of operations, or phone call.

SPECIMEN: Should be submitted fresh in a sterile container or placed on sterile saline moistened gauze (Do not place in Saline solution)

SPECIMEN CONTAINER: Container should be appropriate to the size and nature of the specimen. If culture is indicated Container should be sterile.

LIMITATIONS: Bone or Heavily calcified tissue and fixed tissue cannot be frozen.

TURNAROUND TIMES: Approximately 15 minutes per specimen. Final reports will be given within 48 hours.

ADDITONAL INFORMATION: After completion of the frozen section, the pathologist will call the O.R. and confirm patient identification to report the diagnosis or relate it to the surgeon who requested the frozen section. The same piece of tissue that has been used for the frozen section diagnosis will be processed and used for a permanent paraffin section to corroborate the diagnosis of the frozen section.

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

KIDNEY BIOPSY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

NOTE: Arrangements with Histopathology Department of Pathology and Laboratory Medicine, EXT. 7540, must be made well in advance due to the fact that this is sent to an outside reference laboratory

SPECIMEN: Fresh kidney tissue. Ideally, (3) pieces of tissue are needed

SPECIMEN CONTAINER: Obtain specimen containers from Histology laboratory

FIXATIVE: Place (1) piece of tissue in 10% buffered formalin for light microscopy. Place (1) piece of tissue in 3% cold glutaraldehyde fixative for electron microscopy. The third piece of tissue is immediately frozen for immunofluorescent studies.

METHODS: Light Microscopy, Electron Microscopy, Immunofluorescent studies

LYMPH NODE BIOPSY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

SPECIMEN: Fresh lymph node tissue

CONTAINER: Saline moistened sponge or petri dish. Do not fix with formalin.

TURNAROUND TIMES: 24 – 48 Hours

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

MUSCLE BIOPSY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

NOTE: Arrangements with Histopathology Department of Pathology and Laboratory Medicine, EXT. 7540, must be made well in advance due to the fact that this is sent to an outside reference laboratory.

ADVANCE PREPARATION: The following is needed in order to collect and handle the specimen properly.
1. Two labeled vials, with opening big enough for clams, containing enough 2.5%glutaraldehyde or 10% neutral buffered formalin to fully cover the end of the clamp and contained muscle. The clamps must remain in the fixatives for 1 hour, therefore it is necessary to use tall vials that can be closed or plastic specimen bags. Fix at room temperature.
2. Two isometric muscle biopsy clams (8mm and 15mm) wrapped and sterilized are needed. Other surgical implements are not listed but curved Metzenbaum scissors are good to free and gently elevate muscle cord for clamping.
3. Specimen bottle containing gauze dampened with balanced salt solution, physiologic saline, or mammalian Ringer's. (Note: DAMP, but NOT WET). Place the sealed specimen bottle in crushed ice. Enzyme activity will be stable for about 1 hour, after which time a rapidly declining course will follow.
4. Liquid Nitrogen, isopentane, dry ice and shipping container for frozen specimen should be available. Isopentane cannot be precooled as it will solidify.

SPECIMENS: Three cylindrical specimens are needed, all about 5 mm in diameter and 8 to 16 mm long. For each of the 2 Specimens to be fixed, the surgeon will gently blunt-dissect free a cord of muscle, lift the cord slightly on open scissors, clamp and then cut free the ends of the muscle cord to obtain a roughly cylindrical piece of muscle, held at rest length in the clamp. As noted below, a piece for freezing may be taken with that in the small clamp. Please be advised that this specimen (FOR FREEZING) should be at least 1 cm long. Also note that crushed muscle in the teeth area is not suitable for interpretation.

Clamped specimens should be fixed immediately at room temperature. Do not unclamp for 1 Hour.

MUSCLE BIOPSY

FIXATIVE/ HANDLING SPECIMENS: Each specimen is to be handled as follows:
1. Specimen in 15 mm clamp to 10% neutral buffered formalin. Leave Clamped.
2. Specimen in 8 mm clamp to 2.4% glutaraldehyde. Leave Clamped.

After 1 hour fixation, open clamps and seal specimens into fully labeled vials for shipment. Label vials with full patient name, full social security number, surgical pathology number, site of biopsy, date, and fixative. The specimens should remain in the same fixative solutions for shipment.

Ship Separately from Frozen Specimen. DO NOT FREEZE.

3. Specimen to be frozen.

A cylinder of muscle about 10 mm long and 5 mm in diameter is obtained and kept on damp gauze in a cooled sealed specimen vial until frozen. If the small (8mm) clamp is placed toward one end of the dissected cord or bundle of fibers, the specimen for freezing can be the other end of the same cord. This free end can be left and cut off into the specimen bottle containing the damp gauze before the clamp is put into the fixative. The specimen for freezing should be handled, if necessary, by gently holding at the very end with tweezers. The use of one cord for two specimens minimizes the amount of muscle lost by the patient and also increases the chances of finding, on electron microscopy features seen with histochemical stains.

TESTING SITE: AFIP

ANATOMIC PATHOLOGY

SURGICAL PATHOLOGY

SPECIMENS

NERVE BIOPSY

REQUEST FORM: A Standard Form 515, Tissue Examination, correctly and completely filled out must accompany all specimens. Request Forms Must be time stamped upon receipt in the Laboratory.

NOTE: Arrangements with Histopathology Department of Pathology and Laboratory Medicine, EXT. 7540, must be made well in advance due to the fact that this is sent to an outside reference laboratory.

SPECIMEN: The nerve should be cut with a very sharp blade, preferably a razor blade. It should rest on a firm background while being cut. The proximal end can be tied to indicate the site and also to use as a support for the nerve.
A 1.5 – 2.0 cm. portion of nerve is sufficient.
The excised nerve can be stretched on a piece of dry card with consistency of the regular 3x5 cards to a point that transverse Ridges in the epineurium disappear (under low power microscopy). Then the nerve is left at room temperature for NOT MORE THAN ONE MINUTE. This will lead to sticking of the nerve to the card. Please **indicate the proximal end of the specimen.** Then the area of the card bearing the nerve can be excised and put in the fixative. In this way the nerve is kept straight during Fixation and it is easier to prepare for histological examination.
NEVER PUT THE NERVE ON A GAUZE.

FIXATION: The nerve is immersed in a 2.5% solution of glutaraldehyde in 0.025 M cacodylate buffer (pH 7.35 – 7.45)
It is best to leave the biopsy specimen in fixative for 4 – 6 hours prior to shipment. AVOID FREEZING.

TESTING METHOD: Light and Electron Microscopy

TESTING SITE: AFIP

MICROBIOLOGY

EXAMINATION REQUESTS

Culture requests are electronically entered into the computer under the following test examination areas:

BA – Bacteriology C&S	(Bacteria Culture and Susceptibility)
BC – Blood Culture	(Culture and Susceptibility)
TB – AFB Culture & Smear	(Tuberculosis Acid Fast Culture &Smear)
MY – Mycology Culture	(Fungus culture)
O&P – Ova & Parasites	
Viral Culture	
IMM	Influenza A & B
PCR	Nasal Screen for MRSA

An order number is generated for the specimen. Each order number includes the following information:

Patient Name
Date Ordered
Location of Patient
Patient Social Security Number
Requesting Physician
Source of Specimen
Site of Specimen
Test Requested
Start of Collection
Date and Time of Collection

MICROBIOLOGY

COLLECTION AND HANDLING OF CULTURE SPECIMENS

Prior to each collection, review the laboratory's specimen requirement. Note the proper specimen to be collected, the amount, the procedure, the collection materials, and the storage and handling requirements.

Preparing the Patient: Provide the patient in advance with appropriate collection instructions and information on fasting, diet, and medication restrictions when necessary.

Preparing the Specimen: Confirm identification in the presence of the patient.

Important: ALL SPECIMEN CONTAINERS MUST BE LABELED WITH:

Patient's Name
Full Social Security Number
Specimen Source
Record Time & Date of Collection on order request

During specimen collection, preparation and submission, there is a much greater possibility of critical error than during actual testing or examination of specimen. Errors in storage and handling compromise the integrity of the specimen any results that follow.

MICROBIOLOGY

SPECIMEN CONTAINER/ TRANSPORT MEDIA

Approved sterile specimen containers are located on the Hospital Wards for the collection of urine, sputum, fluids, tissues, and other specimens. Blood culture vials, transport swabs for aerobic and anaerobic cultures, CSF collection kits, stool kits, viral transports, B-D Urine Transports, are supplied and stocked on the wards.

Swabs without transport media should not be used because most bacteria are susceptible to drying and may not survive transport. Transport media contains Amies media and is used for both aerobic and anaerobic cultures.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Anaerobic Cultures (body fluids, secretions, pus from absess, etc.)

Equipment: Anaerobic transport media from Microbiology Lab; Syringe And needle; lodophor liquid (or equivalent) and sterile gauze

General Information: Usually performed by physician; Aspirated culture preferred; Use of anaerobic transport media required

Preparation: Cleanse skin by vigorous 30 second scrub with iodophor

Volume of Specimen: 1 ml

Container/Transport Device: Syringe (no needles), or anaerobic transport media

Technique: Aspirate without air and inoculate directly into anaerobic Transport media. A less desirable alternative is to seal The syringe with a sterile hub and transport, or transfer to A sterile container.

Comments: **Never Refrigerate.** Transport to micro lab immediately

Anaerobic Cutures (tissue)

Equipment: OR Procedure

General Information: Performed by a physician.

Preparation: Surgical skin prep

Volume of Specimen: 1.0 cm tissue

Container/Transport Device: Anaerobic transport media

Technique: Place tissue on surface of anaerobic transport media

Comments: Do not add fluid. **Never Refrigerate.** Transport to Micro Lab immediately.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Body Fluids – Non CSF (ascites, synovial, pericardial, pleural, ect.)

Equipment:	lodophor liquid; Sterile needle and syringe; Sterile gauze; Sterile tube or container.
General Information:	Performed by a Physician
Preparation:	5 minute surgical skin prep with iodophor
Volume of Specimen:	2 – 20 ml (when possible)
Container/Transport Device:	Sterile tube or container
Technique:	Sterile Aspiration
Comments:	Transport to lab within 1 hr. Immediate transport preferred. If limited fluid is collected, physician must establish testing Priority.

Body Fluids (Cerebrospinal Fluid – CSF)

Equipment:	Spinal tap tray
General Information:	Performed by physician
Preparation:	Use sterile technique: prepare skin as for blood culture and drape with sterile linen.
Container/Transport Device:	Sterile screw top tube (leak proof); or sterile vacutainer Tubes
Technique:	Performed by physician. 3-4 tubes are collected for cell Count, biochemical analysis and culture.
Comments:	Send to laboratory immediately. **Do not refrigerate.** If limited volume, physician must establish testing priority.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Catheters (vascular CVP, peripheral or arterial)

Equipment:	Sterile forceps and sterile scissors; lodophor liquid; Sterile Gauze; Sterile drape; sterile gloves; sterile container
General Information:	It may be useful when attempting to determine source of Sepsis, to draw peripheral blood for culture, swab insertion Site and culture sterile portion of vascular line.
Preparation:	Vigorous 30 second concentric scrub with iodophor to Insertion site.
Volume of Specimen:	For 50 – 75 mm catheter, one segment 50 mm (2 inches) Long.
Container/Transport Device:	Sterile Container
Technique:	Using sterile technique, withdraw cannula with forceps and Hold above drape. Cut off 50 mm segment and drop into Sterile container.
Comments:	Transport to the laboratory immediately.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Chlamydia (urethral)

Equipment:	Chlamydia Collection/transport systems (obtain from Micro lab)
General Information:	Performed by physician
Preparation:	Collect at least 2 hrs after the patient has urinated
Volume of Specimen:	Swab
Container/Transport Device:	Chlamydia collection/ transport system
Technique:	Insert a thin urethrogenital swab 2 to 4 cm into the Enourethra, gently rotate it, leave it in place for 1 to 2 seconds, and withdraw it.
Comments:	Vaginal and rectal specimens are not approved assay sites. Specimens other than urethral/ cervical require special Transport media for Chlamydia culture. Micro Lab Requires prior notice in order to obtain appropriate Transport media.

Chlamydia (cervical)

Equipment:	Vaginal speculum, Chlamydia collection/ transport Systems (obtain only from Micro lab)
General Information:	Performed by physician
Preparation:	Use speculum pre-moistened with water. Do not use Lubricant
Volume of Specimen:	Swab
Container/Transport Device:	Chlamydia collection/ transport systems
Technique:	Compress cervix with speculum. Wipe clean of vaginal Secretion and mucus. Rotate a sterile swab and obtain Exudate from the endocervical glands. If no exudates is Seen, rotate the swab in the endocervical canal
Comments:	Same as for Chlamydia (urethral)

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Ear (middle)

Equipment:	Sterile saline; Sterile funnel; Culture swab; Sringe
General Information:	None
Preparation:	Cleanse external canal with saline flush
Volume of Specimen:	Most often swab. Fluid aspiration are performed by Physician
Container/Transport Device:	Sterile tube or transport media for swab (culture swab)
Technique:	Physician will collect through sterile funnel or from Eardrum or beyond.
Comments:	Indicated for otitis media. Transport to lab ASAP

Ear (exteral)

Equipment:	Culture Swab
General Information:	Cleanse external canal with saline flush
Volume of Specimen:	Swab. If fluid is present, physician will aspirate or Scrape area.
Container/Transport Device:	Sterile tube or transport media for swab (culture swab)
Technique:	Take specimen from involved area, preferably including Fresh secretions from deeper areas.
Comments:	Indicated for otitis externa. Transport to lab ASAP

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Eye (internal)

Equipment:	Provided in surgery
General Information:	Performed by physician
Preparation:	Surgery
Volume of Specimen:	Must be of sufficient size to recover small numbers Of organisms.
Container/Transport Device:	Sterile tube
Technique:	Surgical technique
Comments:	Transport to lab immediately (hard to obtain specimen)

Eye (external)

Equipment:	Culturette, sterile tube or container and a sterile platinum Spatula.
General Information:	Scraping is performed by physician. Swab may be Performed by Nursing personnel.
Preparation:	Swab should be collected before topical anesthetics. Cleanse around eye with antiseptic and use sterile cotton And saline to remove cosmetics and ointment.
Volume of Specimen:	A moistened swab is used in most cases. For viral and Chlamydial infections, corneal scrapings may also be done
Container/Transport Device:	Culturette swab or a sterile tube or container for scrapings
Technique:	Pass moistened swab over conjunctiva. Avoid eyelashes And lid margin. Use platinum spatula for scraping. Transport to laboratory immediately.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Feces (bacterial culture)

Equipment:	Clean stool collection cup with tight fitting lid, Tongue Blade, and Bedpan/ commode. Vial containing transport Buffers available from Microbiology if transport is delayed.
General Information:	All specimens are for culture. Clostridium difficile must be Ordered separately.
Preparation:	Fresh Stool
Volume of Specimen:	At least 1 gram of feces.
Container/Transport Device:	Clean container. Place liquid stools in plastic sterile Container with secure, screw-capped lid. Enteric culture Transport vial available from Microbiology if transport is Delayed.
Technique:	If collected in bedpan, do not contaminate with urine, Residual soap or disinfectants.
Comments:	Transport to lab within 1 hour. If delayed transport is Anticipated, contact Microbiology lab for transport buffers. **Do Not Refrigerate.**

Feces (Clostridium difficile toxin assay)

Equipment:	Clean stool collection cup with tight fitting lid, Tongue Blade, and Bedpan/commode
General Information:	Culture available upon special request. If patient has had a positive result within the previous Two weeks, repeat testing is not indicated unless Persistent symptoms exists.
Preparation:	None
Volume of Specimen:	1 stool

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Container/Transport Device:	Clean container. Place liquid stools in plastic container With a tight fitting lid. Or pass stool into a clean, dry Bedpan, and transfer stool into leak proof container With tight fitting lid. If collected in bedpan, do not Contaminate with urine, residual soap or disinfectants.
Comments:	Positive results are called to the requesting physician

Feces (ova and parasites)

Equipment:	Clean stool collection cup with tight fitting lid, Tongue Blade, and Bedpan/commode/ Vial containing appropriate Preservative.
General Information:	Active cases may contain trophozoites only. These forms Die quickly outside the body.
Preparation:	Fresh stool. May require saline purge. No cathartics; Obtain before administering barium
Volume of Specimen:	3 specimens at 24 hour intervals.
Container/Transport Device:	Clean container. Place liquid stools in plastic container With secure, screw-capped lid. Transport vial containing Preservative available in Microbiology if transport is Delayed.
Technique:	Pass stool directly into a sterile, wide-mouth, leak-proof Container with a tight fitting lid. Or pass stool into a clean, Dry bedpan, and transfer stool into leak-proof container With tight fitting lid. If collected in bedpan, do not Contaminate with urine, residual soap or disinfectants.
Comments:	Transport to lab within 1 hour. If delayed transport is Anticipated, contact Microbiology lab regarding Appropriate transport vial.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Genital Tract – Female (cervix)

Equipment:	Vaginal speculum, culture swab
General Information:	Refer to Syphilis and Gonorrhea for additional Information Performed by physician, PA or Nurse Practitioner
Preparation:	Use speculum pre-moistened with water. Do not use Lubricant
Volume of Specimen:	2 swabs
Container/Transport Device:	Culture swab.
Technique:	Compress cervix with speculum. Wipe clean of vaginal Secretion and mucus. Rotate a sterile swab and obtain Exudates from the endocervical glands. If no exudates is Seen, rotate the swab in the endocervical canal.
Comments:	Transport to Microbiology lab immediately. **Do not Refrigerate.**

Male (penile lesion)

Equipment:	Culture Swab
General Information:	Refer to Syphilis and Gonorrhea for additional information. Performed by physician, PA, Nurse Practitioner or nursing Staff.
Preparation:	Do not use alcohol. Cleanse skin with water and soap
Volume of Specimen:	Swab or Scraping
Container/Transport Device:	Culture swab
Technique:	Take Culture directly from lesion
Comments:	Transport to the Microbiology Laboratory immediately **Do not Refrigerate**

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Genital Tract – Male (Prostatic massage fluid)

Equipment:	Culture swab
General Information:	Used primarily to diagnose acute or chronic prostatitis
Preparation:	Collect specimens at least 2 hours after the patient has Urinated. Wipe clean with sterile gauze.
Volume of Specimen:	Swab
Container/Transport Device:	Culture swab
Technique:	Perform digital massage through the rectum
Comments:	GC found infrequently

Genital Tract – Male (urethra)

Equipment:	Culture swab
General Information:	Routine swab can be performed by nursing staff or Physician. Refer to Syphilis and Gonorrhea for Additional recommendations.
Preparation:	Collect specimens at least 2 hours after the patient has Urinated. Wipe clean with sterile gauze.
Volume of Specimen:	Swab
Container/Transport Device:	Culture Swab
Technique:	Insert a thin urethra-genital swab 2 to 4 cm into the Endourethra, gently rotate it, leave it in place for 1 to 2 Seconds, and withdraw it. OR Collect urethral exudate
Comments:	Transport immediately to Microbiology lab. Urethra, anus And throat are preferred sites for GC.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Gonorrhea

Equipment:	Culture swab (Please note: Cotton swabs may inhibit the Growth of some strains of GC). Rectal gloves
General Information:	Male: Performed by Physician, PA or Nurse practitioner. The presence of intracellular gram negative diplococci On a urethral smear is sufficient for diagnosis of GC, but Must be followed up with culture Female: Performed by physician, PA or Nurse practitioner. Normal vaginal flora makes gram stain an unreliable Diagnostic tool. Culture must be performed.
Preparation:	Urethra: Collect at least 2 hrs after the patient has urinated. Cervical: Use speculum pre-moistened with water. Do not Use lubricant.
Volume of Specimen:	Urethral, endocervical, anal and pharyngeal cultures with Sterile culture swabs
Container/Transport Device:	Culture Swab
Comments:	Neisseria gonorrhea is an extremely sensitive organism and Must be plated ASAP to obtain optimal culture results. Transport to Microbiology Lab immediately. Positive Results must be reported to Infection Control Nurse. Positive Results must be entered into NEDSS.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Gonorrhea (anal or throat swab)

Equipment:	Swab
General Information:	Refer to Syphilis for additional information
Preparation:	None
Volume of specimen:	Swab
Container/Transport Device:	Swab
Technique:	Insert swab about 25 mm to sample anal crypts. Allow Several seconds for absorption of organisms into swab.
Comments:	Transport immediately to Micro Lab.

Respiratory Tract (Legionella Culture and DFA)

Equipment:	Call laboratory for more specific information
General Information:	Testing must be specifically requested.
Preparation:	Call laboratory for more specific information
Volume of Specimen:	Lower respiratory tract specimens accepted. Appropriate Specimens include pleural fluid, sputum, bronchoscopy Specimens and lung biopsy material.
Container/Transport Device:	Sterile container
Technique:	Determined by specific specimen type
Comments:	None

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Respiratory Tract (Bordetella pertussis)

Equipment:	Flexible nasopharyngeal swab/ Viral Transport Media
General Information:	Performed by the physician
Preparation:	Patient must not be on antimicrobial therapy
Volume of Specimen:	Nasopharyngeal swab
Container/Transport Device:	Flexible swab placed in transport media
Technique:	Pass through anterior nares into posterior nasopharynx, Rotate and remove. Place swab into viral transport media. (cut or bend swab)
Comments:	Transport to the laboratory immediately

Respiratory Tract (Corynebacterium diphtheriae)

Equipment:	Flexible nasopharyngeal swab. Culture swab for throat lesions
General Information:	Nasopharyngeal specimen collection performed by the Physician.
Preparation:	none
Volume of Specimen:	Nasopharyngeal specimen or swab of throat lesion
Container/Transport Device:	Flexible swab, Culturette
Technique:	For Nasopharyngeal specimen pass through anterior nares Into posterior nasopharynx, rotate and rotate For Culture, swab
Comments:	Transport to the laboratory

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Respiratory Tract (Throat)

Equipment:	Culture Swab
General Information:	Neisseria gonorrhea requests must be specified on request. Culture can be performed by physician or nursing staff
Preparation:	None
Volume of Specimen:	Swab
Container/Transport Device:	Swab
Technique:	Swab area of exudation, membrane formation or Inflammation.
Comments:	Indicate specific isolate to be cultured (if suspect) Transport swab immediately to the lab. **Do not Refrigerate.**

Respiratory Tract (nasopharynx)

Equipment:	Flexible nasopharyngeal swab
General Information:	Performed by physician
Preparation:	None
Volume of Specimen:	One nasopharyngeal swab
Container/Transport Device:	Flexible swab with transport media
Technique:	Pass through anterior nares into nasopharynx, rotate and Remove
Comments:	Useful for Bordetella pertussis

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Sputum (AFB)

Equipment:	Sterile specimen cup with lid
General Information:	Patients suspected of having TB must be in **Respiratory Isolation**
Preparation:	Mouth care: brush teeth/ dentures and rinse
Volume of Specimen:	3 consecutive early morning specimens preferred (5 – 10 ml per specimen)
Container/Transport Device:	Sterile container
Technique:	Same as for routine culture
Comments:	Negative AFB cultures are held 8 weeks

Sputum (expectorated)

Equipment:	Sterile container with lid
General Information:	May be performed by Nursing. A gram stain is performed Routinely to screen for specimen adequacy.
Preparation:	May require induction. Mouth care: brush teeth/dentures And rinse
Volume of Specimen:	Sputum (not saliva). 3-5 ml first morning specimen Preferred.
Container/Transport Device:	Sterile container
Technique:	Early morning expectoration best. Patient expectorates Directly into container. May need supervision to help Induce deep cough.
Comments:	Transport to Microbiology Laboratory within 1 hour. Inadequate specimens (saliva) are rejected. Repeat Specimen requested.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Sputum (tracheal aspirate/ suctioned specimen)

Equipment:	Suction equipment, Lukens tube, sterile container with lid.
General Information:	May be performed by Nursing Staff
Preparation:	Mouth care as indicated for routine sputum culture
Volume of Specimen:	3-5 ml
Container/Transport Device:	Sterile container
Technique:	Sterile
Comments:	Transport to Microbiology Laboratory within 1 hour

Urine (clean catch/ midstream)

Equipment:	Sterile Urine specimen Cup; Castile soap towelette
General Information:	may be performed by Nursing Staff or patient
Preparation:	Instruct patient to clean perineal area with soap towelette or Soap and water. In uncircumcised males, retract fore-skin and wash glans. Wash in concentric manner away from Urethra.
Volume of Specimen:	1 ml for bacterial, 50 ml for Mycobacterial or fungal Culture
Container/Transport Device:	Sterile urine transport tube containing preservative, or a Sterile specimen cup for routine culture. Urine for Mycobacterial or fungal cultures must be sent in sterile Specimen cup.
Technique:	After cleansing, void 20-25 ml, then collect specimen. Clean outside of container before submitting.
Comments:	Early morning specimens best. Tansport to lab within 1 hr Urines collected in sterile specimen cup. **MUST BE REFRIGERATED**. Sterile urine transport tube containing Preservative available from laboratory if delay in transport.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Urine (foley catheterization)

Equipment:	Sterile syringe, needle and alcohol swab
General Information:	May be performed by nursing staff. Do not disconnect Catheter from drainage system. Urine for culture is not to Be taken from the collection bag. Urine for culture may be Collected during continuous irrigation if the irrigant is Clamped off for 30 minutes prior to collection
Preparation:	Clamp drainage tubing. Recheck tubing until urine is Present.
Volume of Specimen:	1 ml for bacterial, 50 ml for Mycobacterial or fungal culture
Container/Transport Device:	Sterile urine transport tube containing preservative, or a Sterile specimen cup for routine culture. Urine for Mycobacterial or fungal cultures must be sent in sterile Specimen cup.
Technique:	Cleanse sample port with 60 second scrub of alcohol. Aspirate through sample port. Transfer to urine transport Tube.
Comments:	Transport to lab within 1 hour. **Refrigerate** if transport Will be delayed. Foley catheter tips are not acceptable for Culture.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Urine (straight catheterization)

Equipment:	Catheterization kit.
General Information:	May be collected by nursing staff.
Preparation:	Instruct patient to clean perineal area with soap towellette Or with soap and water. In uncircumcised males, retract Fore-skin and wash glans. Wash in concentric manner Away from urethra
Volume of Specimen:	1 ml for bacterial, 50 ml for Mycobacterial for fungal Culture
Container/Transport Device:	Sterile urine transport tube containing preservative, or a Sterile specimen cup for routine culture. Urine for Mycobacterial or fungal cultures must be sent in sterile Specimen cup.
Technique:	Catheterize patient. Drain urine into appropriate sterile Container. Remove Catheter.
Comments:	Transport to lab with 1 hour. **Refrigerate** if transport will Be delayed.

Viral Cultures

Equipment:	Swab, Sterile specimen container, or blood tube
General Information:	Order should specify exact specimen/ source/ origin. Blood and urine specimens are cultured for CMV only.
Preparation:	None
Volume of Specimen:	Sterile swab, 10 ml urine (first morning specimen), Tissue (1gm), body fluids, throat or nasopharyngeal Washings, or blood. Specimen type depends on nature of Illness.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Container/Transport Device:	Viral Transport media, heparinized (green-topped) sterile Evacuated blood collection tube or sterile container.
Technique:	Viral Transport media is used for specimens that are likely To be contaminated with bacteria and/ or fungi. Typical Specimens include genital, oral or skin scrapings, vesical Fluids, throat washings and/ or swabs, anal swabs, and eye Exudates. After collecting specimen, remove Viral Transport Media Cap, insert swab into media and replace Cap. Sterile tissue and fluid specimens (CSF, pericardial Fluid) should be placed directly into sterile container. Blood should be collected in a sterile, heparinized (green-Topped), evacuated blood collection tube.
Comments:	Transport to Microbiology lab within 1 hour of collection. Specimens must be kept cold and moist (Refrigerated)

Wound (aspiration or biopsy)

Equipment:	Iodophor liquid, 70%alcohol, sterile gauze, sterile needle And syringe
General Information:	Needle aspiration of pus is the optimal technique. Biopsy Of burns and decubiti yields best results. Needle aspiration Or biopsy is performed by physician. Sterile aspiration Without needle may be performed by Nursing.
Preparation:	Sterile technique should be used for all specimens obtained By aspiration or biopsy. Non-intact skin is cleansed with Soap and water or flushed with sterile saline prior to Collection. Intact skin surface is cleansed with 70% Alcohol and then with 60 second concentric scrub with an Iodophore solution prior to collecting the specimen.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Volume of Specimen:	1 ml pus, fluid or biopsy, if possible
Container/Transport Device:	Transfer aspirate to sterile container. A less desirable Alternative is to seal the syringe with a sterile hub and Transport.
Technique:	Aspirate the deepest part of the lesion, collecting both Fluid and cells from the base of the lesion. If the initial Aspiration fails to obtain material, inject sterile, diluent Saline subcutaneously and repeat aspiration attempt.
Comments:	Tranport immediately. Swabs of superficial Wounds, (especially decubiti) should not be Routinely collected.

Wound (superficial)

Equipment:	Culture swab, iodophor liquid, sterile gauze
General Information:	May be performed by Nursing Staff
Preparation:	Open wound cultures – specimens should be Collected by culturette following these instructions:

a. Before taking the specimen for swab culture:
   -Cleanse the wound well with water or Saline
   -Remove excess necrotic debris
   -compress the edges to elicit new drainage
b. Use the swab tip to swab the healthy looking tissue
   -DO NOT swab exudate, pus, eschar, or Heavily fibrous tissue

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Volume of Specimen:	Swab
Container/Transport Device:	Culture Swab
Technique:	Roll the tip of cotton-tipped applicator under wound Edge or into fistula or sinus tract. Replace applicator Into culturette and crack ampule at base of transport With firm finger pressure.
Comments:	Swabs of superficial wounds, (especially decubiti) Are of very limited value and should not be collected

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Mycobacterial (TB, AFB) Examination (Sent to Philadelphia VAMC)

Proper collection and handling of specimens are the most important criteria for the successful isolation of mycobacteria. Collect specimens early. If immediate delivery to laboratory is impossible or laboratory processing is delayed, refrigerate specimens. Specimens received in formalin or PAP fixative are not acceptable.

1. Respiratory Secretions

   Sputum (spontaneously coughed) – Patient should rinse mouth with water, Not mouthwash, before producing purulent material from the first deep Cough of the morning. Sputum should be expelled into a sterile container Without contamination by saliva or nasal secretions. Pooled sputum Specimens collected over several hours and put in the same container are NOT acceptable. They are more likely to be contaminated. For the best Recovery of mycobacteria, collect 3 early morning specimens on separate Days. Early morning specimens containing the collected secretions Accumulated during the night will yield the most isolates.

   Sputum (induced by aerosolization) – Patients who are unable to produce Sputum may be induced to cough up sputum by breathing aerosolized Warm 105 sodium chloride or 10% glycerin and 15% sodium chloride Solution for about 10 minutes. Induced sputum may appear watery and Resemble saliva.

   Bronchial Secretions – Collect in a sterile container

   Transtracheal Aspirates – Transtracheal aspiration bypasses oropharyngeal Contamination. A narrow lumen trochar with needle is inserted into the Trachea, then a catheter is extended down into the bronchi. A syringe is Attached to the catheter and fluid is aspirated into the syringe. If no

Material can be aspirated, a small amount of bacteriostatic sterile saline Solution may be injected through the catheter and into the bronchi and Aspirated back into the syringe. All trastracheal aspirates are cultured and Stained for mycobacteria.

2. GASTRIC CONTENTS. Not acceptable for mycobacterial culture.

3. URINE: Collect an aliquot (30 to 50ml) of first morning voided urine on three Separate days. Pooled 24 hour urines are NOT acceptable for mycobacterial Culture. AFB smears are not done on urines because saprophytic acid-fast Bacilli may be present.

4. BONE MARROW AND BODY FLUIDS THAT MAY CLOT: Collect in Green top tubes containing heparin.

5. SPECIMENS ON SWABS (WOUNDS, FLUIDS, ETC.) NOT recommended for AFB culture.

6. BONE: Place specimen directly in sterile container.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

Parasitology (Ova & Parasites) (Sent to Philadelphia VAMC)

1. Feces: Should be submitted in a SAF Collection kit. Under NO conditions should water or urine be present. Mineral oil, bismuth or magnesia compounds will render the specimen unsatisfactory. Specimens should not be collected for 7 – 10 days after barium or bismuth has been given. Antibiotics may cause temporary decrease or absence of organisms in the stool, and reliable diagnosis may not be possible for 2 -3 weeks or more.

2. SAF Collection:
   These collection kits MUST be used for Ova & Parasite exams.

MICROBIOLOGY

MICROBIOLOGY SPECIMEN COLLECTION PROCEDURES

BLOOD CULTURES

Blood cultures should be obtained for various reasons to include: sudden increase of body temperature, onset of chills, prostration and hypostension, prolonged, mild and intermittent fever, clinically suspected systemic infections, and prior to treatment with antibiotics.

Procedure for Collection:

1. Patient Identification:
   (a) Check patient identification by direct communication if possible and or Checking the wristband. Ask the patient his/her full name and full Social security number. Always ensure proper patient identification.

2. Specimen Collection Containers and Preparation:
   (a) Anaerobic and Aerobic Blood culture bottles are used
   (b) Flip off the caps of the bottles and disinfect the exposed top of the bottle Stopper using 70% isopropyl alcohol and allow to dry. Do not touch the top of the stopper after disinfection.

3. Site Selection:
   (a) Select a different site for each culture drawn.
   (b) Avoid drawing blood through indwelling intravenous or intra-arterial catheter unless blood cannot be obtained by venipuncture or unless the diagnosis of catheter sepsis is suspected.

4. Site Preparation:
   (a) Vigorously cleanse the venipuncture site with 70% isopropyl
   (b) Starting at center of the site, swab concentrically with 1 to 2% tincture of iodine for 30 seconds or with 10% povidone-iodine solution for 1 min.
   (c) Allow to dry. Iodine must remain on the skin for at least 1 min.
   Please Note: For patients with known hypersensitivity to iodine, a double application of sterile 70% isopropyl alcohol is recommended.

(d) Do not touch the venipuncture site after preparation and prior to phlebotomy.

5. Venipuncture:
   (a) Use a venipuncture collection set (butterfly) for collection of blood.
   (b) Insert needle into skin. Once blood begins to flow, put blood culture bottles into the adapter.
   (c) Allow 3 – 10 ml of blood to flow into each of the blood culture bottles.
   (d) Two bottles are always drawn (anaerobic and aerobic). The anaerobic bottle should be drawn first.
   (e) If drawing with other blood work, the blood culture bottles need to be drawn first.
6. After phlebotomy, discard the collection device in the sharps container.

7. Cleanse the site with alcohol to remove remaining iodine.

8. Properly label bottles with patient information, time of collection and your initials Being careful not to cover the barcode of the blood culture bottle.

9. Mix the blood and broth by inverting 4 – 5 times.

10. Number and timing of blood cultures:
    All routine blood cultures must be ordered and collected X 2, 30 minutes apart, 2 separate sites with the exception of the following disease states:
    (a) Acute sepsis, meningitis, osteomyelitis, arthritis, acute untreated bacterial pneumonia, or pyelonephritis: Obtain two blood samples from two separate sites before starting therapy.
    (b) Suspected endocarditis, continuous bacteria of low magnitude.
        (1) Acute: Draw three samples from three separate sites during the First 1 to 2 hours of evaluation and begin therapy.
        (2) Subacute: Draw three samples on day one (15 min. or more Apart). Repeat, if negative within 24 hours.
        (3) Endocarditis patients on therapy – Draw two separate samples On each of three successive days.

(c) Patients on antimicrobial therapy:
    (1) Draw six samples within 48 hours, collect immediately Prior to next dose of antimicrobial agent.

(d) Fever of unknown origin:
    (1) Obtain two separate samples initially 1 hour apart. After 24 to 36 hours, obtain two more before temperature rises.

11. Deliver to Microbiology Department.

12. Do not Refrigerate.

PATIENT INSTRUCTIONS

GLUCOSE TOLERANCE TEST

To Prepare for the Glucose Tolerance Test

1. A full carbohydrate diet is required for at least 3 days prior to the date the test is scheduled for.

2. Twelve (12) hours before the test, you must begin fasting.

3. You should not even have black coffee during the fasting period.

What to Expect the Day of the Test

1. You will report to the third floor laboratory.

2. Expect to stay for a minimum of 3 hours—possibly 6 hours.

3. You will have your blood drawn initially and be asked to give a urine specimen.

4. You will have to wait approximately 15 – 30 minutes while the laboratory performs the tests on your blood work.

5. You will then be asked to drink a small bottle of a very sweet drink. You will need to drink this down in 5 – 15 minutes. The laboratory tech will note the time you finish this drink.

6. In ½ hour after you complete the drink, you will have your blood drawn again and be asked to give another urine specimen.

7. The laboratory tech will give you a time schedule for the remaining of the testing.

Important Patient Instructions for During the Testing Period

1. You will not be able to eat or drink anything during the entire testing period (3-6 hours)

2. You will not be able to smoke at all during the entire testing period

3. You must stay in the laboratory waiting area during the testing period; You should not walk around. You must be seated.

PATIENT INSTRUCTIONS

MIDSTREAM CLEAN-CATCH COLLECTION OF URINE

Patient Instructions

INSTRUCTION FOR MALES

1. Wash hands with soap and dry them.
2. Open the urine container and avoid touching the insides.
3. If uncircumcised, with draw foreskin.
4. Using the povidone-iondine wipe, clean the urethral opening and the area around it.
5. Repeat the cleaning with the second pad.
6. Wipe the area dry with the gauze pad.
7. Begin urinating and pass the first portion of the urine into the toilet.
8. Then, midstream, begin urinating into the urine container. Fill the urine container with the mid-portion of the urine only.
9. Pass the remaining urine into the toilet.
10. Fasten the lid on the urine container.

PATIENT INSTRUCTIONS

MIDSTREAM CLEAN-CATCH COLLECTION OF URINE

Patient Instructions

INSTRUCTION FOR FEMALES

1. Wash hands with soap and dry them.
2. Open the urine container and avoid touching the insides.
3. Sit on the toilet and spread genital lips with one hand.
4. Using the povidone-iodine wipe, clean the urethral opening and the area around it working from front to back.
5. Repeat the cleaning with the second pad.
6. Wipe the area dry with the gauze pad.
7. Begin urinating and pass the first portion of the urine into the toilet.
8. Then, midstream, begin urinating into the urine container. Fill the urine container with the mid-portion of the urine only.
9. Pass the remaining urine into the toilet.
10. Fasten the lid on the urine container.

PATIENT INSTRUCTIONS

MIDSTREAM VOIDED COLLECTION OF URINE

Patient Instructions

INSTRUCTION FOR FEMALES

1. Wash hands with soap and dry them
2. Open the urine container and avoid touching the insides
3. Sit on the toilet and spread genital lips with one hand. Hold the urine container in the other hand.
4. Begin urinating and pass the first portion of urine into the toilet.
5. The, midstream, begin urinating into the urine container. Fill the urine container with the mid-portion of the urine only.
6. Pass the remaining urine into the toilet.
7. Fasten the lid on the urine container.

MIDSTREAM VOIDED COLLECTION OF URINE

Patient Instructions

INSTRUCTION FOR MALES

1. Wash hands with soap and dry them
2. Open the urine container and avoid touching the insides
3. If uncircumcised, withdraw foreskin.
4. Begin urinating and pass the first portion of urine into the toilet
5. The, midstream, begin urinating into the urine container. Fill the urine container with the mid-portion of the urine only.
6. Pass the remaining urine into the toilet
7. Fasten the lid on the urine container.

PATIENT INSTRUCTIONS

PATIENT HANDOUT FOR FECAL OCCULT SLIDE TESTING

PAGE 1 OF 2

PATIENT INSTRUCTIONS:

Be sure that you read and follow the Patient Instructions completely 7 days prior to performing the test.

CAUTION: If you do not follow the Patient Instructions, you may compromise the accuracy of the test.

DIETARY INSTRUCTIONS

DO NOT CONSUME THE FOLLOWING DRUGS, VITAMINS, AND FOODS

1. Avoid **7 days** prior to and during the test period:
   -Aspirin or other non-steroidal anti-inflammatory drugs*

2. Avoid **72 hours** prior to and during the test period:
   -Vitamin C in excess of 250 mg per day (from all sources, dietary and supplemental)
   -Red Meat (beef, lam), including processed meats and liver
   -Raw fruits and vegetables containing high peroxidase (especially melons, radishes, turnips and horseradish)

3. DO EAT for **2 days** prior to and during the test period:
   -eat only small amounts of well-cooked chicken, turkey, and tuna
   -eat generous amounts of raw and cooked vegetables and fruits including lettuce, corn, spinach, carrots, celery, and apples.
   -eat plenty of bran cereals and moderate amounts of popcorn

***Caution:** some iron supplements contain Vitamin C which may exceed the Vitamin C daily limit. Please consult your doctor, if this or any part of the patient instructions is a problem. Do not stop aspirin therapy without first consulting your physician.

PATIENT INSTRUCTIONS

PATIENT HANDOUT FOR FECAL OCCULT SLIDE TESTING

PAGE 2 OF 2

Collecting the Specimen:

1. Be sure to collect three consecutive bowel movements when doing the test.

2. Lift the seat of the toilet.

3. Paper is provided inside the kit. Place paper across the toilet bowl leaving a little bit of slack. The paper will catch the stool specimen and not allow it to fall into the water.

4. Using the applicator provided, collect a small amount of stool specimen from the toilet, on one end of the applicator.

5. Open the front flap of the Slide #1. (The side with your name on it).

6. Apply a thin smear to box A on the slide. Using the same stick, collect another small sample from a different part of the stool and apply a thin smear to box B of that same slide. Close cover Flap. Discard stick into waste container.

7. If possible, allow the remainder of the stool to fall into the toilet. Paper can be flushed.

8. Store Slide in an envelope or brown paper bag.

9. On subsequent bowel movements, repeat the procedure for the additional slides.

10. Put completed slides in the plastic bag provided and return to the laboratory as soon as completed. **DO NOT MAIL** standard envelopes. **SPECIAL MAILING ENVELOPES ONLY** may be sent through the mail. The slides are given out in these special "foil" envelopes.

11. Allow enough time for mail delivery, since the tests must be developed within 14 days of sample collection.

PATIENT INSTRUCTIONS

24 HOUR URINE COLLECTION SPECIMEN

Patient Instructions

The following is the correct method for collecting a 24-hour urine specimen:

1. Upon arising in the morning, the patient should void and discard specimen. Note the time. Save all urine from that time for the next 24 hours.

2. Patients should void for the last time as close to the noted time as possible.

EXAMPLE: 8:00 A.M. – Note the time and date of Day #1

The last specimen to complete 24 hour collection should be voided as close as possible to 8:00 A.M.

Note the time and date of Day #2 (i.e. 24 hours later).

! CAUTION: Do Not Void Directly into the Urine Jug. Jug may contain acid. A separate urine cup will be given to you to void in. Then pour the urine into the jug.
Be sure to save all urine.

PATIENT INSTRUCTIONS

24 HOUR URINE FOR 17-KETOSTEROIDS

Patient Instructions

Dietary Restrictions:
NONE

Special Collection:
The urine should be collected in a jug containing special preservative (1 – 2G Boric Acid). Keep the jug on ice during collection.

The following is the correct method for collecting a 24-hour urine specimen:

1. Upon arising in the morning, patients should void and discard specimen. Note the time. Save all urine from that time for the next 24 hours.

2. Patients should void for the last time as close to the noted time as possible.

EXAMPLE: 8:00 A.M. – Note the time and date of Day #1

The last specimen to complete 24 hour collection should be voided as close as possible to 8:00 A.M.

Note the time and date of Day #2 (i.e. 24 hours later).

! CAUTION: Do Not Void Directly into the Urine Jug. Jug may contain acid. A separate urine cup will be given to you to void in. Then pour the urine into the jug.
Be sure to save all urine.

PATIENT INSTRUCTIONS

24 HOUR URINE FOR CATECHOLAMINES

Patient Instructions

DIETARY RESTRICTIONS:

Patients must not use tobacco, drink coffee, tea, or alcohol for at least 4 hours prior to the test or during the entire test (24 hours).

SPECIAL COLLECTION:

The urine should be collected in a jug containing special preservative (30 ML 6 N HCL). Keep the jug on ice during the collection.

The following is the correct method for collecting a 24-hour urine specimen:

1. Upon arising in the morning, the patient should void and discard specimen. Note the time. Save all urine from that time for the next 24 hours.

2. Patients should void for the last time as close to the noted time as possible.

EXAMPLE: 8:00 A.M. – Note the time and date of Day #1

The last specimen to complete 24 hour collection should be voided as close as possible to 8:00 A.M.

Note the time and date of Day #2 (i.e. 24 hours later).

! CAUTION: Do Not Void Directly into the Urine Jug. Jug may contain acid. A separate urine cup will be given to you to void in. Then pour the urine into the jug.
Be sure to save all urine.

PATIENT INSTRUCTIONS

24 HOUR URINE FOR METANEPHRINES

TESTS INCLUDED:

Metanephrine
Normetanephrine

Patient Instructions

DIETARY RESTRICTIONS:

NONE

SPECIAL COLLECTION:

The urine should be collected in a jug containing special preservative (30 ML 6 N HCL). Keep the jug on ice during the collection.

The following is the correct method for collecting a 24-hour urine specimen:

1. Upon arising in the morning, the patient should void and discard specimen. Note the time. Save all urine from that time for the next 24 hours.

2. Patients should void for the last time as close to the noted time as possible.

EXAMPLE: 8:00 A.M. – Note the time and date of Day #1

The last specimen to complete 24 hour collection should be voided as close as possible to 8:00 A.M.

Note the time and date of Day #2 (i.e. 24 hours later)

! CAUTION: Do Not Void Directly into the Urine Jug. Jug may contain acid. A separate urine cup will be given to you to void in. Then pour the urine into the jug.

PATIENT INSTRUCTIONS

24 HOUR URINE FOR VANILLYL MANDELIC ACID (VMA)

Patient Instructions

DIETARY RESTRICTIONS:

Patients must not consume chocolate, plantains, bananas, aspirin, coffee, tea, alcohol, vanilla, and caffeine for 48 hours prior to the test and during the test (24 hours).

SPECIAL COLLECTION:

The urine should be collected in a jug containing special preservative (30 ML 6 N HCL). Keep the jug on ice during the collection.

The following is the correct method for collecting a 24-hour urine specimen:

1. Upon arising in the morning, the patient should void and discard specimen. Note the time. Save all urine from that time for the next 24 hours.

2. Patients should void for the last time as close to the noted time as possible.

EXAMPLE: 8:00 A.M. – Note the time and date of Day #1

The last specimen to complete 24 hour collection should be voided as close as possible to 8:00 A.M.

Note the time and date of Day #2 (i.e. 24 hours later).

! CAUTION: Do Not Void Directly into the Urine Jug. Jug may contain acid. A separate urine cup will be given to you to void in. Then pour the urine into the jug.
Be sure to save all urine.

PATIENT INSTRUCTIONS

24 HOUR URINE FOR 5 – HIAA (SEROTONIN)

Testing Information

Quantitative Study is performed only if qualitative study is positive.

Patient Instructions

DIETARY RESTRICTIONS:

Patients should not eat avocados, bananas, eggplant, pineapple, plums, tomatoes, walnuts, or take cough syrup containing glycerol guaiacolate, naproxen, anaprox, or any preparation containing these drugs for a 48 hour period prior to the test and during the test (24 hours).

SPECIAL COLLECTION:

The urine should be collected in a jug. No preservative in the jug is required. Keep the jug on ice during the collection.

The following is the correct method for collecting a 24-hour urine specimen:

1.Upon arising in the morning, the patient should void and discard specimen. Note the time. Save all urine from that time for the next 24 hours.

2. Patients should void for the last time as close to the noted time as possible.

EXAMPLE: 8:00 A.M. – Note the time and date of Day #1

The last specimen to complete 24 hour collection should be voided as close as possible to 8:00 A.M.

Note the time and date of Day #2 (i.e. 24 hours later).